The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 139, NO. 9 — CHICAGO, ILLINOIS — FEBRUARY 26, 1949

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DISCONTINUOUS THERAPY WITH PENICILLIN

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Virtually all of the clinical experience with penicillin has been obtained with dosage schedules which provide what is generally referred to as "continuous therapy." Continuous therapy has come to mean the maintenance at all times of drug concentrations in the patient's blood equal to or greater than the concentration which inhibits growth of the infecting organism in vitro. The commonest method of providing continuous treatment utilizes frequent doses of penicillin administered at short intervals. The other commonly used method employs forms of penicillin which are slowly absorbed from the site of injection. Both of these types of dosage schedule are relatively simple and practicable. Each has certain disadvantages, although these disadvantages have not been considered of importance in view of the therapeutic effectiveness of the drug.

Despite the fact that continuous treatment with penicillin is obviously highly effective, there is no proof that it is necessarily the most desirable or the most practicable form of therapy. Since all of the conventional dosage schedules now employed are based on the concept that continuous treatment is optimal treatment, it has been of interest to review the basis for this concept. Only a brief summary need be presented here, since a complete review of the evidence for and against the validity of this concept has recently been published by Marshall.[1]

Prior to the development of the sulfonamide drugs, the few effective agents available for chemotherapy of infections—for example, the arsenical drugs and quinine—were commonly administered at relatively infrequent intervals. With the sulfonamide drugs, the concept arose that in the treatment of a given infection there exists a particular concentration of drug which may be called the "therapeutic level." Lower concentrations than this were considered less effective and higher concentrations no more effective. Whether or not this concept is valid for the sulfonamide drugs, it has been useful in the administration of the different sulfonamide drugs, which vary considerably in absorption, degrees of acetylation and toxicity. The application of these same principles to the use of penicillin was undoubtedly due, in part, to the general acceptance of these principles as fundamentally sound and independent of differences in potency, toxicity and mode of action among different drugs. Another important influence has been that the measurement of penicillin in the blood has constituted the only rapid means of evaluating different dosage schedules and dosage forms. Although this method has been extremely valuable, its widespread use has tended to attach to the levels themselves a certain intrinsic significance which appears unwarranted.

It is apparent, however, from a review of several early reports on the use of penicillin that some investigators were clearly of the opinion that continuous treatment was not necessary, although they used it for economic reasons, which at that time were of prime importance. Moreover, there are reports of several experimental studies and a few clinical reports to support this opinion. Of particular interest are the studies of the treatment of infections in experimental animals reported by Jawetz [2], White, Lee and Alverson [3], and Zubrod.[4] At least six clinical reports contribute additional evidence.[5] In an extensive and carefully documented study reported in 1944, Tillett and his associates [5a] concluded that satisfactory therapy in pneumoccoccic pneumonia was attained with doses of 10,000 to 25,000 units four times a day. They pointed out that intervals of twelve to sixteen hours could elapse between doses without altering the favorable results. In a study of the oral use of penicillin in pneumonia, Bunn and his associates [5b] omitted the doses of penicillin at night in some patients as soon as it became apparent that defervescence was occurring.

From these and other observations, it appeared that the conventional dosage schedules of penicillin, although therapeutically effective, were based largely on an unproved assumption. Moreover, the problems created several years ago by limited supply and high cost of penicillin are now either nonexistent or becoming

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Read before the Section on Internal Medicine at the Ninety-Seventh Annual Session of the American Medical Association, Chicago, June 24, 1948.

This study was aided in part by grants from the Lederle Laboratories Division, American Cyanamid Co., Pearl River, New York; and from Charles Pfizer and Co., Inc., Brooklyn.

1. Marshall, E. K., Jr.: The Dosage Schedule of Penicillin in Bacterial Infections, Bull. Johns Hopkins Hosp. **82**: 403, 1948.

2. Jawetz, E.: Dynamics of Action of Penicillin in Experimental Animals: Observations on Mice, Arch. Int. Med. **77**: 1 (Jan.) 1946.

3. White, H. J.; Lee, M. E., and Alverson, C.: Therapeutic Effectiveness of Single Oral Doses of Penicillin, Proc. Soc. Exper. Biol. & Med. **62**: 35, 1946.

4. Zubrod, C. G.: Comparative Efficiency of Single and Multiple Dosage Regimens of the Penicillins, Bull. Johns Hopkins Hosp. **81**: 400, 1947.

5. (*a*) Tillett, W. S.; Cambier, M. J., and McCormick, J. E.: The Treatment of Lobar Pneumonia and Pneumococcal Empyema with Penicillin, Bull. New York Acad. Med. **20**: 140, 1944. (*b*) Bunn, P. A.; McDermott, W.; Hadley, S. J., and Carter, A. C.: The Treatment of Pneumococcic Pneumonia with Orally Administered Penicillin, J. A. M. A. **129**: 320 (Sept. 29) 1945. (*c*) Officer, R.; Loewenthal, J., and Perry, J. W.: Penicillin: An Investigation and Clinical Trial, M. J. Australia **2**: 473, 1944. (*d*) Lourie, E. M.: Ambulatory Treatment of Early Syphilis with Penicillin, Lancet **2**: 696, 1945. (*e*) Bedford, P. D.: Penicillin in General Practice, ibid. **1**: 977, 1946. (*f*) Wheatley, D. P.; Massive Penicillin Doses in General Practice, Brit. M. J. **1**: 530, 1947.

increasingly less important. It seemed of interest, therefore, to investigate further the effectiveness of discontinuous penicillin therapy, employing relatively large doses of sodium penicillin G in aqueous solution administered at intervals of twelve to twenty-four hours. The present report is a summary of the clinical experience thus far obtained with this treatment regimen.

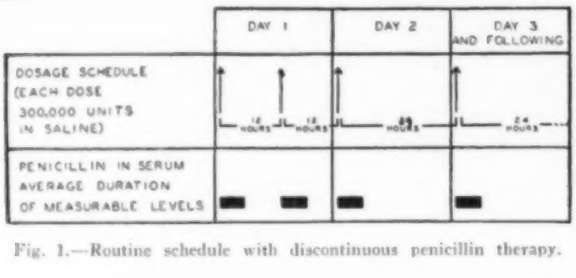

Fig. 1.—Routine schedule with discontinuous penicillin therapy.

The study has been conducted on the Cornell-New York Hospital Medical Service and the Cornell Division of Bellevue Hospital. One part of the study has been limited to a comparison of the clinical results obtained with continuous and discontinuous therapy in a single disease, uncomplicated pneumoccic pneumonia. The other has been an attempt to determine the practicability of a regimen of discontinuous penicillin therapy as a routine for the treatment of a variety of infections, exclusive of those already known to require unusually large doses of penicillin.

DOSAGE SCHEDULES

In figure 1 may be seen a schematic outline of the dosage schedule which was arbitrarily chosen for discontinuous therapy and which has been used throughout this study. Each dose of penicillin consisted of 300,000 units of crystalline sodium penicillin G in 1.0 cc. of isotonic sodium chloride solution, administered by intramuscular injection. On the first day of treatment, the patient received two doses of penicillin twelve hours apart. Twelve hours after the second dose, the third dose was given, and from that time to the completion of treatment, the patient received only one daily dose of 300,000 units. As indicated in figure 2, after a single dose of 300,000 units, measurable concentrations of penicillin were present in the patient's serum, on the average, for five hours.

The continuous treatment regimen consisted of a single daily dose of 300,000 units of procaine penicillin in oil,[6] which in a previous study conducted in this clinic [7] was shown to provide continuous low concentrations of penicillin in the blood for twenty-four hours, with more regularity than other dosage forms available at the time. In figure 2 may be seen a comparison of the serum concentrations of penicillin obtained during a twenty-four hour period with these two treatment schedules. As indicated in figure 2, after a dose of 300,000 units in aqueous solution, a high peak is reached within a few minutes. The concentration then falls rapidly and on the average is measurable for five hours.[8] Concentrations sufficient to inhibit pneumococci in vitro are present longer than five hours, but in all likelihood are not maintained as long as eight hours following a single dose of 300,000 units.

The lower solid line in figure 2 illustrates the median penicillin concentrations in the serum as determined in 33 patients after a single 300,000 unit dose of procaine penicillin in oil. As may be seen, the concentrations throughout the twenty-four hour period were relatively constant. Of interest also was the fact that in individual patients decided fluctuations from one time to another were seldom observed.

TREATMENT OF PNEUMOCOCCIC PNEUMONIA

Each of the treatment regimens previously described was established as the routine for the treatment of pneumococcic pneumonia on one medical ward. Treatment was initiated with this routine in all patients in whom the observations at the time of the original examination made it seem likely that they had uncomplicated pneumococcic pneumonia. During the period of the study, 39 patients received discontinuous therapy, and of these 19 had the characteristic observations of pneumococcic pneumonia, as determined by clinical, roentgenographic and bacteriologic examinations. In the same period, 32 patients received continuous treatment, and, of these 21 proved to have pneumococcic pneumonia. For comparison of the clinical results obtained with the two dosage schedules in a disease of reasonably predictable course, the patients with proved pneumococcic pneumonia may be considered as a group and the remainder of the cases discussed later.

Of 19 patients who received aqueous penicillin, 12 were over 50 years of age and 5 were over 70. The oldest patients were 81 and 82. Of those who received procaine penicillin, fewer happened to be in the older age groups, although the average age was 59, as compared

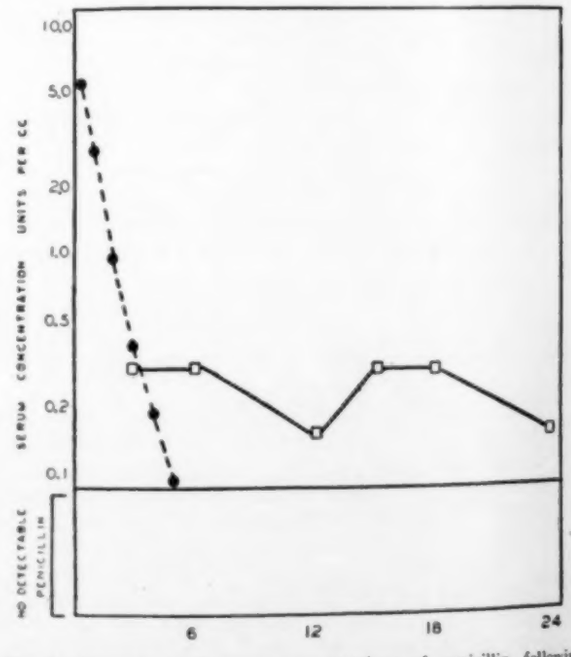

Fig. 2.—Comparison of serum concentrations of penicillin following single doses of aqueous sodium penicillin G and procaine penicillin in oil. The unbroken line represents sodium penicillin G (300,000 units in sesame oil), and the broken line presents sodium penicillin G (300,000 units in aqueous solution). The horizontal row of figures at the bottom shows the number of hours after administration.

with 56 in the other group. Only 2 of the first group had positive blood cultures, as compared with 6 in the second group. Many of the patients had, in addition to the acute infection, some chronic disease which could have compromised their chances for recovery.

6. Obtained through the Chas. Pfizer & Co., Inc., Brooklyn.
7. Goldstein, O.; Shultz, S., and Tompsett, R.: Procaine Penicillin: Serum Concentrations of Penicillin Following a Single Intramuscular Dose, to be published.
8. Tompsett, R.; Shultz, S., and McDermott, W.: Influence of Protein-Binding on the Interpretation of Penicillin Activity in Vivo, Proc. Soc. Exper. Biol. & Med. **65**: 163, 1947.

From observations at the bedside of patients treated with these two dosage schedules, it has been impossible to distinguish any differences in the clinical results in the two groups, in spite of the obvious differences in the type of administration of penicillin. In early observations, impressions were gained that differences existed in the rate of defervescence and in the speed with which various symptoms abated. Further experience, however, has not borne out these impressions, and at present it seems unlikely that there are real differences of this sort between the responses to the two types of treatment.

The most graphic representation of the therapeutic effectiveness of penicillin in a patient with pneumonia has always been the patient's temperature chart. It is of interest, therefore, to compare the temperature curves of the patients receiving crystalline sodium penicillin G with discontinuous therapy with those who received procaine penicillin. For this comparison, calculation has been made of the mean temperature of each group of patients for each day of the first week of treatment. The same calculations were also made in 20 consecutive patients with pneumococcic pneumonia treated during

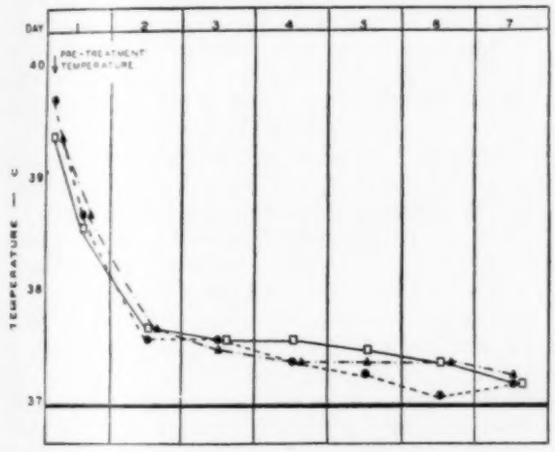

Fig. 3.—Mean temperature with three dosage schedules of penicillin therapy in pneumococcic pneumonia. The broken line represents discontinuous therapy (19 patients); the unbroken line represents procaine penicillin (21 patients), and the line of dots and dashes represents a schedule of 20,000 units every two to three hours (20 patients).

the previous year with 20,000 units of aqueous penicillin intramuscularly every two or three hours. The three composite temperature curves obtained in this way are illustrated in figure 3. In each curve the first point represents the mean temperature of the entire group just prior to the start of therapy. Each additional point is the mean temperature for a twenty-four hour period and is derived from 60 to 120 values. The similarity of these composite curves is even closer than one might have anticipated. The uniformity of the temperature response is even more striking when one considers that it occurs in spite of many variable factors, such as age, nutritional state and various associated diseases, which might influence the response to treatment.

It has been apparent from the outset, however, that it will be necessary to treat large numbers of patients if one is to evaluate accurately the comparative value of discontinuous therapy. In these small numbers of cases, figures on the incidence of complications and death are of little or no value. It is important, however, that a review of these cases of uncomplicated pneumonia include data on all the patients treated, regardless of what the eventual diagnosis proved to be.

In addition to the patients with proved pneumococcic pneumonia, 20 patients on the one ward received a discontinuous treatment and 11 on the other ward received procaine penicillin. All were thought to have uncomplicated pneumococcic pneumonia on admission. In all but 4 cases, the response to treatment and subsequent course were as favorable as in the cases just

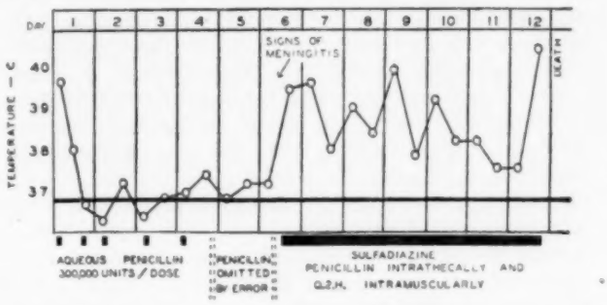

Fig. 4.—Graph of data for a 47 year old man under treatment for pneumonia who had type II pneumococcic meningitis.

discussed, and it is probable that the admitting diagnosis was generally correct. They are considered separately solely because of our failue to obtain the complete data required to establish with certainty the diagnosis of pneumococcic pneumonia. The pertinent observations in the remaining 4 cases may be considered briefly.

Of the 4 patients in whom unfavorable results occurred, 2 received discontinuous treatment. The sequence of events, which was essentially the same in both, is of particular interest. In figure 4 is illustrated the course of a 47 year old man who was admitted with signs of pneumonia. Cultures of blood and sputum were positive for Pneumococcus type II. Although he was seriously ill at the time of admission, his response to treatment seemed prompt and his course at first favorable. On the fifth and sixth days, through an error he received no penicillin. Late on the sixth day he had a chill; signs of meningitis rapidly developed, and he died despite the intensive therapy indicated.

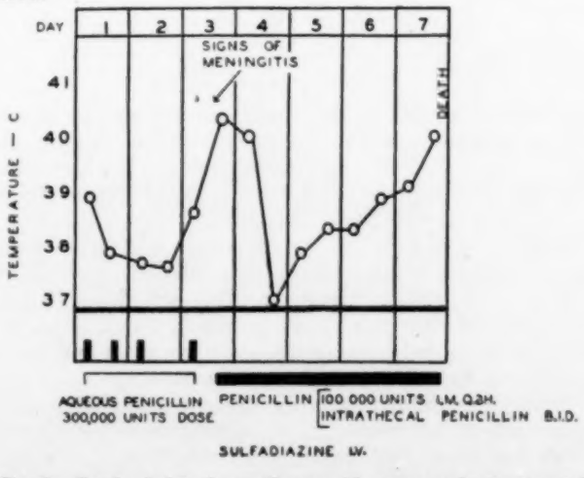

Fig. 5.—Graph of data for a 68 year old woman under treatment for pneumonia who had type III pneumococcic meningitis.

Figure 5 illustrates the course of a 68 year old woman who had pneumonia on admission. Blood culture and sputum culture were positive for Pneumococcus type III. Following an initial period of defervescence, a severe headache developed on the morning of the third day, and within a few hours she had evident signs of

meningitis. Despite intensive treatment she died on the seventh day.

The outcome in these 2 patients must certainly be considered as failure of treatment. The question immediately arises as to whether meningitis would have ensued had penicillin been administered with one of the conventional dosage schedules. Unfortunately, it appears, from the available evidence, that none of the penicillin dosage schedules now used in pneumonia uniformly afford protection against the development of pneumococcic meningitis. Nevertheless, the events in these 2 patients suggest the possibility that suppurative complications which occur in patients receiving continuous therapy may occur with greater frequency if discontinuous therapy is used.

During the same period, death occurred in a patient treated with procaine penicillin. This patient was a 56 year old man who was critically ill when admitted on the sixth day of illness. He had signs of pneumonia, and type XXIX pneumococci were isolated from the sputum. He received procaine penicillin, and, although in the first twenty-four hours he appeared improved, he then rapidly became worse. The dosage schedule was then changed to 200,000 units of aqueous penicillin every three hours, but he died late on the second hospital day. Permission for autopsy was not obtained. This case must be considered as a failure of a continuous treatment schedule in pneumococcic pneumonia. Some doubt is cast on the diagnosis, however, by the fact that at the time of admission the blood culture was sterile and the total leukocyte count was only 6,800 per cubic millimeter.

The second patient who was treated with procaine penicillin and who may represent a treatment failure was a 17 year old boy admitted on the third day of illness. At the time of admission, no signs of fluid in the chest were noted on physical examination or in the roentgenogram of the chest. Only eighteen hours later, however, definite signs of a large pleural effusion were present and the diagnosis of empyema was confirmed by thoracentesis. Although empyema may have developed after the start of treatment, it seems likely that it was present at the time of admission, but not detected.

USE OF DISCONTINUOUS THERAPY IN OTHER INFECTIONS

In the other part of the study, no attempt at simultaneous comparison of dosage schedules was made. Instead, the regimen of discontinuous therapy was instituted as a routine on the Infectious Disease Pavilion of the New York Hospital. Treatment was ordered by members of the resident staff who were free to choose other dosage schedules at the outset or were permitted to change to other schedules if they felt a patient's progress was unsatisfactory. Patients were also seen daily by members of the attending staff, in addition to those conducting the study.

During the fifteen months prior to reporting this dosage schedule proved to be satisfactory for use in the vast majority of patients admitted to this ward. In virtually all patients whose treatment was initiated in this way, the entire course of treatment was completed with no alteration in dosage. In a few instances, when, for one reason or another, it was decided that intensive penicillin therapy might offer added benefit, treatment was changed to doses of 50,000 units or more every two hours. In no patient thus far encountered has this change been of any obvious value. It should be emphasized, however, that discontinuous therapy has not been initiated in patients with such infections as staphylococcic bacteremia and subacute bacterial endocarditis, in whom it may be anticipated that intensive penicillin treatment will be required. These patients, however, make up a relatively small proportion of the total number to whom penicillin is given.

Thus far, this treatment regimen on this ward has been used in a total of 104 patients with a variety of infections. Of this total, 59 patients had the clinical evidences of bacterial pneumonia, and in 25 the diagnosis of pneumococcic pneumonia could be established with certainty. The ages of the patients with pneumococcic pneumonia ranged from 15 to 83 years, the average age being 48. Four had positive blood cultures. The average maximum leukocyte count for the group was 20,300 per cubic millimeter. Seven patients had heart disease, and 2 of these had frank signs of heart failure. In all of these 25 cases of pneumococcic pneumonia, the course under treatment with penicillin appeared in no way to differ from that observed with conventional dosage schedules, and no suppurative complications or deaths occurred. It should be noted that some of these patients received two daily doses of penicillin for more than one day. In only 6 of the 25, however, were two daily doses continued for more than two days. It is of interest, also, to note that in 4 patients only one daily dose of penicillin was given throughout the entire period of treatment.

In addition, 2 patients had pneumonia thought to be caused by group A hemolytic streptococci. In 1 of these it occurred in association with measles. In the other, streptococci were isolated from a small metastatic abscess of the skin. Both patients recovered promptly after treatment was initiated. The only death was that of a 69 year old woman with cardiac failure and chronic renal disease. On admission, signs of pneumonia were present and culture of the sputum yielded only Staphylococcus aureus. After the institution of treatment she rapidly became afebrile, and it was felt that the infection was being controlled. She remained afebrile and had no further leukocytosis, but the signs of cardiac failure and uremia progressively increased. She died on the seventh hospital day, five days after the time of defervescence.

In the remaining 31 patients treated for pneumonia on this ward, the etiologic diagnosis was not established. Patients who proved to have primary atypical pneumonia have been excluded as well as possible from consideration here, and it is felt that from the clinical observations and the response to treatment the great majority probably had pneumococcic pneumonia. In no case did any untoward event occur which was attributed to the possibility that insufficient penicillin was being given.

The remainder of the cases in which it was thought possible to judge the occurrence of a response to therapy included examples of the following infections: hemolytic streptococcic pharyngitis, fusospirochetal infections of the pharynx and buccal mucosa, scarlet fever, erysipelas, cervical adenitis, cellulitis secondary to lacerations or other trauma, pneumococcic tracheobronchitis and generalized staphylococcic pyodermia. In all of these cases, evaluation of the treatment is difficult because of the natural tendency toward spontaneous recovery. It can only be stated that in no instance was progression of disease observed or other events which would seem to denote failure or inadequacy of penicillin therapy.

DEVELOPMENT OF ANTIBODIES

Studies by Weinstein and Tsao[9] and by Kilbourne and Loge[10] have shown that treatment of certain streptococcic infections with penicillin may prevent the usual development of antistreptolysin. The latter investigators observed also that the discontinuous administration of penicillin interfered to a considerably less extent with the development of antistreptolysin than did continuous treatment. The eventual significance of these differences in relation to the occurrence of late nonsuppurative complications is of great interest. Although of no obvious importance in relation to recovery from pneumonia, it seemed of interest to determine whether there were differences in antibody formation in patients with pneumonia who were treated with different dosage schedules of penicillin. The data thus far obtained on the development of specific agglutinins in patients receiving discontinuous and continuous therapy are insufficient to permit final conclusions on the comparative time of development of agglutinins and the height of the antibody rise in the two groups. Thus far, however, specific agglutinins have been observed in approximately the same proportion of cases in both groups, and no differences in the titer of antibodies are apparent.

SUMMARY

A study has been made of therapeutic effectiveness of discontinuous penicillin therapy, consisting of one or two daily doses of penicillin in aqueous solution. Since March 1947, this dosage schedule has been used in the treatment of 125 patients with various acute infections, including 44 patients with pneumococcic pneumonia.

From observations thus far made, it appears that this treatment regimen provides entirely satisfactory therapy for the great majority of penicillin-susceptible infections. It should be emphasized, however, that such discontinuous therapy presumably would be inadequate in the treatment of serious staphylococcic infections, bacterial endocarditis and certain other rarely encountered infections which usually require large quantities of penicillin. Moreover, on theoretical grounds, it is possible that discontinuous penicillin therapy might not be the equal of intensive continuous therapy in the prevention of nonsuppurative complications of group A hemolytic streptococcic infections. Finally it should be emphasized that, from the observations in 2 patients with pneumococcic meningitis, the possibility is suggested that certain suppurative complications which occur in patients receiving continuous treatment may occur more frequently if discontinuous treatment is employed. Nevertheless, the clinical results observed in the treatment of pneumococcic pneumonia and other frequently encountered infections indicate that highly effective penicillin treatment may be provided by discontinuous therapy without the rigid restrictions imposed by conventional dosage schedules and dosage forms, which are based on the concept that continuous levels of drug in the body are required. More extensive clinical trial is necessary, however, to obtain a precise evaluation of the comparative value and the limitations of discontinuous therapy.

9. Weinstein, L., and Tsao, C. C. L.: Effects of Types of Treatment on Development of Antistreptolysin in Patients with Scarlet Fever, Proc. Soc. Exper. Biol. & Med. **63**: 449, 1946.

10. Kilbourne, E. D., and Loge, J. P.: The Comparative Effects of Continuous and Intermittent Penicillin Therapy on the Formation of Antistreptolysin in Hemolytic Streptococcal Pharyngitis, J. Clin. Invest. **27**: 412, 1948.

ABSTRACT OF DISCUSSION

DR. W. W. G. MACLACHLAN, Pittsburgh: The present method of continuous regular intramuscular injections has certain disadvantages, chiefly in that it requires someone to give the injections at regular two to four hour interevals. This method has been effective. Dr. Tompsett has presented a procedure of giving penicillin in a fairly large dose at long intervals of time. According to his clinical observations the results in treatment, as compared with the continuous method, are the same. His method simplifies and improves the intramuscular injection method of therapy. Other methods of therapy may also be improved. The probable chief reason why the sulfonamide drugs were so widely and effectively given by physicians was that oral therapy was the method of choice. My associates and I have been interested in treating pneumococcic pneumonia with penicillin by mouth. In the past year we have had cases of severe pneumococcic pneumonia in Pittsburgh, at least, in our clinic. Seventy-four patients were treated by the oral method, while 75 were given the regular three hour intramuscular injection of 25,000 units per injection for a total of 500,000 units, or a little more in some cases. The mortality rate in the group receiving the drug orally was 8 per cent, while that for the group receiving intramuscular therapy was 9 per cent. In 74 patients with bacteremia treated orally with penicillin there was an incidence of positive cultures of 29 or 39 per cent and a 10 per cent mortality rate. In the group treated intramuscularly, 75 patients, 19, or 25 per cent, had bacteremia, with a 15 per cent mortality rate. These figures would indicate that one can freely recommend, to the physician who is distant from hospital facilities, that orally administered penicillin is effective in pneumococcic pneumonia. I give a tablet containing 100,000 units every hour for six doses and then one every two hours for eighteen doses, or 24 tablets, 2,400,000 units in all. This dosage is about four times the amount which had been given by intramuscular injection, which is in keeping with the experimental studies. There is no reason to feel that this oral method cannot be altered. Perhaps it may be susceptible to the same type of change that Dr. Tompsett made in continuous intramuscular therapy. In any case, two methods of simplified penicillin therapy are available.

DR. FREDERICK H. KING, New York: Two facts have become increasingly clear. First, in some infections at least the continuous maintenance in the blood of a so-called therapeutic level during a twenty-four hour period is not essential to the achievement of clinical cure; secondly, the attainment of inordinately high blood levels does not necessarily result in hastening or even insuring a favorable therapeutic result. Moreover, if the hypothesis of Eagle that the production of excessively high levels may paradoxically lessen the effectiveness of the antibiotic should prove to be correct in vivo, then the production of high levels may not only be unnecessary but in fact be undesirable. To the former thesis, namely, that continuous blood level is unnecessary in certain infections, a concept already suggested by previous workers, Dr. Tompsett and his colleagues have brought powerful support. In a negative way, our experience supports the contention of Dr. Tompsett and his co-workers, who, like Marshall, believe that physicians have attached to blood penicillin levels an intrinsic significance which is not warranted. With the aid of carinamide my co-workers and I have been able to maintain for relatively long periods high levels of over 50 units per cubic centimeter and peak levels as high as 300 units per cubic centimeter. However, we have not been successful in demonstrating in clinical trials the superiority of such high levels over levels previously regarded as optimum, though it must be mentioned that we confined ourselves to diseases such as subacute bacterial endocarditis, which is more resistant to therapy than those diseases enumerated in this study. For instance, with such massive doses as 14,000,000 units per day for ten days and the persistently high levels achieved with carinamide, we were able to obtain a clinical cure in only 1, or possibly 2, out of 8 cases of subacute bacterial endocarditis—an experience which convinced us that such a regimen offered no advantage, at least in this disease, over prolonged treatment with smaller doses and lower levels.

DR. TOMPSETT: I should like to take this opportunity to disclaim any originality for the principles involved in this therapy. In this study, we felt that we were only attempting a more extensive demonstration of certain principles which had already been established. I should like also to suggest that continuous and discontinuous treatment actually may be different in certain rather subtle ways, which may not be so immediately apparent. Kilbourne and Loge recently observed that in hemolytic streptococcic pharyngitis discontinuous treatment interferes with the development of antistreptolysin much less than does continuous treatment. This observation is of interest, particularly in that it may have some bearing on the development of late nonsuppurative complications of this disease.

USE AND MISUSE OF ENDOCRINE THERAPY IN STERILITY

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Los Angeles

With the increasing availability of potent endocrine products, these substances have had an extensive range of clinical application. However, despite advances in knowledge of the physiologic relationships of endocrines, clinical therapy has been in many circumstances a "hit and miss" affair. Notably has this been true in the field of infertility, where various of the so-called sex hormones have been employed with extremely variable results. Such variability may be ascribed, in considerable measure, to the complexities of the sterility problem and perhaps to the disproportionate attention to the hormonal factors. In this connection, it cannot be overemphasized that normal fertility in a mating entails a number of important factors, only some of which are disturbed to any clinical extent by endocrine disorders.

The requisites for normal fertility in the female may be summarized as: (1) normally functioning ovaries, in which there is cyclic maturation of a graafian follicle with ovulation and subsequent corpus luteum formation, (2) a normal uterus, reactive to stimulus of the sex hormones, (3) a patent and receptive genital tract, which permits adequate migration of sperm and egg and subsequent travel of the fertilized egg to its site of nidation, (4) protection and nourishment of the developing embryo and (5) safe delivery.

The requisites for normal fertility in the male are: (1) production of adequate numbers of sperm, (2) secretion of a fluid medium favorable for conveyance of sperm, (3) a patent ductile tract, permitting transport of the sperm into the vaginal canal, and (4) adequate performance of coitus.

Despite the fact that considerable attention has been given to endocrine factors in sterility, hormonal disturbances are not the most important cause of involuntary childlessness. Winson,[1] for example, in analyzing a series of 257 cases, found tubal occlusion to be the most important female causative factor, occurring in 54 per cent of the cases. Guerrero [2] found tubal factors in 44 per cent of a large series of women, with hormonal causes occurring in 23 per cent. My observations indicate that endocrine causes constitute only about 20 to 25 per cent of involuntary sterility. This fact must be emphasized since the quantity of endocrine therapy utilized in this particular problem is frequently out of proportion to hormonal etiologic involvement. Accordingly, there can be no substitute for the initial accurate evaluation of the infertile couple or for a thorough investigation to uncover the underlying pathologic condition, whatever that may be. While space does not permit a complete description of what constitutes adequate evaluation, it may be summarized that a routine detailed investigation may require for the wife: a complete history and physical examination, complete blood cell count, determination of the sedimentation rate, urinalysis, determination of basal metabolic rate, blood cholesterol and/or iodine, vaginal smears for hormonal effect, endometrial biopsy, tubal insufflation and/or salpingography, postcoital examinations of cervical and vaginal secretions and studies of basal temperature curves, as well as, on occasions, hormonal assays. In the man, evaluation requires complete history and physical examination, determination of basal metabolic rate, blood cholesterol and/or iodine, repeated semen examinations and, in some instances, testicular biopsies, hormonal assays and studies of the ductal apparatus.

There is no real short cut to a thorough investigation, for most cases of infertility involve more than a single causative factor. After careful and extensive study, indications for endocrine therapy may become apparent, and when such therapy is limited to these cases the inconsistency of results should be substantially reduced.

ENDOCRINE PHYSIOLOGY IN REPRODUCTION

The functions of all the endocrine glands are undoubtedly interrelated, and hence it would be an erroneous concept to isolate specific glands as those, alone, involved in the reproductive process. However, I shall limit discussion to those hormones the activities of which are most directly concerned with fertility.

According to current knowledge, the gonadotrophic secretions of the anterior pituitary are believed to be the primary controlling hormonal influence on the male and female gonads. In the female, the two gonadotrophic factors, follicle-stimulating hormone (F.S.H.) and luteinizing hormone (L.H.) are said to act in a cyclic manner during the menstrual cycle. During the first half of the cycle the activity of the follicle-stimulating hormone predominates and causes growth and development of the graafian follicles together with secretion of the follicular (estrogenic) hormone. In the second half of the cycle, the luteinizing hormone stimulates development of the corpus luteum and hormonal secretion from this latter structure (figure). The two ovarian hormones, namely estrogenic and corpus luteum, act on the auxiliary sexual apparatus, producing various effects. From the point of view of fertility, the most significant of these are the cyclic actions on the uterus. During the first half of the cycle, estrogenic hormone causes proliferation of the endometrium, and during the second half of the cycle—superimposed on the estrogenic influences—the corpus luteum induces secretory changes in the endometrium, preparing it for nidation. Should pregnancy occur, continued and increased elaboration of hormones from the corpus luteum takes place, and this structure con-

Certain studies in connection with this report have been aided by a research grant from Lederle Laboratories, Inc.
Read before the Section on General Practice at the Ninety-Seventh Annual Session of the American Medical Association, Chicago, June 25, 1948.
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1. Winson, S. G.: Am. J. Obst. & Gynec. **56**: 631 (Oct.) 1946.
2. Guerrero, C. D.: Obst. y ginec. latino-am. **4**: 208 (March) 1946.

times to develop. During the fourth month of pregnancy, however, the placenta largely takes over the production of the three types of hormones; gonadotropes, estrogens and corpus luteum.

In the male, the gonadotrophic hormones are believed to be the same as in the female. Follicle-stimulating hormone stimulates sperm production, and luteinizing hormone stimulates secretion of the male sex hormone. This latter substance, in turn, acts on the secondary sex structures, including seminal vesicles, effecting their normal functions.

It should be noted that production of sperm and production of male sex hormone are related to the pituitary rather than to each other and that, according to current concepts, the male hormone does not act directly on the testes to influence sperm production.

ENDOCRINE THERAPY IN THE FEMALE

Failure of Ovulation.—Probably one of the most frequently treated functional disorders in infertility is failure of ovulation. It has been amply demonstrated that regular cyclic vaginal bleeding in the absence of ovulation can and does occur.[3] However, the frequency of this condition is debatable. There is no completely reliable direct evidence of ovulation other than the actual visualization of a newly formed corpus luteum. The best indirect evidence of ovulation is, of course, the appearance of the premenstrual endometrial biopsy specimen. For practical purposes in the study of sterility, the endometrial biopsy specimen is taken within twelve hours after the onset of the menstrual period, since, if bleeding is awaited, there is little possibility of disturbing a pregnancy. The histologic observation of endometrium in the nonsecretory phase is strongly suggestive of the lack of corpus luteum function and hence lack of ovulation.

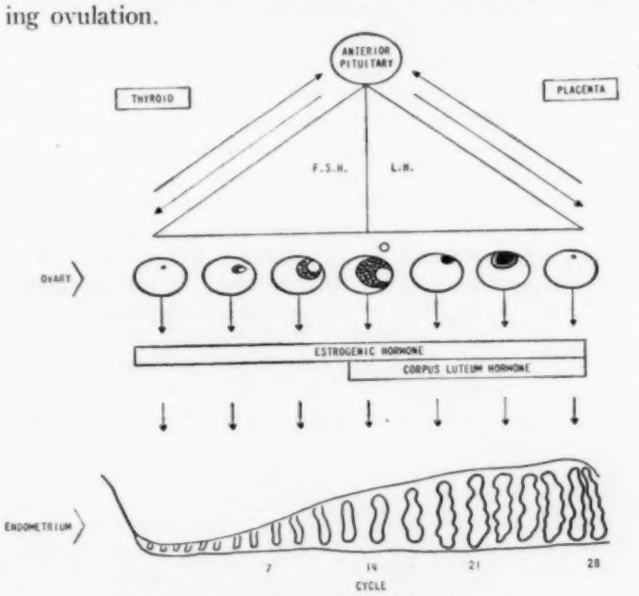
Hamblen,[4] Mazer and Israel[5] and others have pointed out that while the biopsy is in general a reliable test, in interpretation one must always take into account the fact that the endometrium may be refractive to corpus luteum and that, in some cases, ovulation may have occurred even when a proliferative phase endometrium is obtained.

Basal body temperature curves offer good guides to the occurrence of ovulation; in fact, when studied over a number of cycles, temperature curves may furnish more complete knowledge than an isolated biopsy. Tompkins[6] and others have emphasized the biphasic nature of the menstrual curve during the normal ovulatory cycle. The observation of monophasic curves in several cycles is suggestive of repeated anovulation.

Despite the fact that treatment of anovulation is relatively common, there are few statistical estimates of a high incidence of this particular condition. Sharman[7] in 335 endometrial biopsies found that in only 23 were there definite signs of anovulatory cycles. Mazer & Israel[5] stated the belief that some anovulatory cycles are found in 16 per cent of sterile women, regardless of the primary cause, and in 30 per cent of sterile women in whom no other cause of sterility is found.

Even on the basis of these latter figures, certainly not more than 1 out of every 3 or 4 infertile women would require treatment for anovulation, a fact which must be considered before resorting to any stimulative therapy.

Endocrine therapy of anovulation has not been too successful. Preparations of various pituitary gonadotropins have been used rather extensively with rather conflicting results. The type of preparation which would be expected to prove successful is that containing large amounts of follicle-stimulating hormones. Two types of follicle-stimulating hormone preparations are commercially available, those derived from (1) pregnant mares' serum (P.M.S.) and (2) pituitary tissue. The former group has been more extensively employed clinically. Siegler and Fein,[8] Hall[9] and others have reported some encouraging results with pregnant mares' serum, whereas Geist, Gaines and Salmon[10] and Erving, Sears and Rock[11] stated that they did not believe that this material is effective in inducing ovulation.



Pituitary, ovary and endometrium relationship.

One important obstacle in the problem is the lack of establishment of accurate dosages, which will induce normal, and not excessive, follicle development. There has been evidence of excessive follicle stimulation with some of these substances and the concomitant possible development of cystic ovaries.

There is, also, the possibility of untoward allergic reactions, since these preparations are of a protein nature. Several serious reactions have been reported. Our usage of preparations of pregnant mares' serum has been relatively disappointing, and we believe that such therapy, if employed, should be considered definitely experimental, requiring very close supervision of the patient.

Infantile Uterus.—A hypoplastic uterus is frequently but one feature of a generalized state of hypogonadism. On occasion, however, the uterus may be poorly developed while other manifestations of gonadal function are

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8. Siegler, S. L., and Fein, M. J.: Am. J. Obst. & Gynec. **38:** 102 (Dec.) 1939.
9. Hall, G. J.: Am. J. Obst. & Gynec. **53:** 259 (Feb.) 1947.
10. Geist, S. H.; Gaines, J. A., and Salmon, U. J.: Am. J. Obst. & Gynec. **42:** 619 (Oct.) 1941.
11. Erving, H. W.; Sears, C., and Rock, J.: Am. J. Obst. & Gynec. **40:** 695, 1940.

fairly normal. In the presence of an infantile uterus, pregnancy may not readily occur, or, if it does, there may be predisposition to abortion. In some instances, development of the hyoplastic uterus can be induced by estrogenic therapy. Dosage should be rather heavy and preferably in cyclic form, to avoid interference with the menstrual flow. Therapy is started on the last day of each menstrual period and continued for three weeks, for three, four or more cycles. A daily dosage of 5 mg. of diethelstilbestrol is recommended, or the equivalent in other orally administered estrogens, such as dienestrol, hexestrol or conjugated estrogens.

Poor Corpus Luteum Function.—In some instances ovulation occurs, yet subsequent development and activity of the corpus luteum are below normal. The endometrium will then fail to develop full secretory changes and hence be inadequate for nidation and maintenance of the early embryo.[11a] This condition may be disclosed by the observations of repeated biopsies which show only poor secretory changes late in the cycle. Basal temperature curves with gradual rather than abrupt midcycle elevations are also suggestive of poor corpus luteum effect, although there is considerable disagreement on this point.

Therapy may be either (1) stimulative, with gonadotrophic hormone, or (2) substitutional, with corpus luteum hormone. Because of its more consistent action, substitution therapy with corpus luteum is probably the method of choice. Progesterone, 10 mg., is given intramuscularly, starting the eighteenth day of the cycle and continuing until bleeding occurs. If menstruation does not occur, the same dosage is continued until about the fourth month and then reduced to one every third day until fetal motion is felt. Potent corpus luteum hormone may be used orally, but this has the disadvantage of being considerably more costly in comparable dosage. If oral therapy is to be employed, a daily dosage of 40 mg. of pregneninolone is recommended. With the cost of this medication averaging about 25 cents for each 10 mg. tablet, it is obvious that continuous use may represent a financial burden. Orally administered preparations of corpus luteum derived from the gland itself have not been shown to have any clinical effectiveness; while many of these are inexpensive, they are also worthless.

Habitual Abortion.—The fairly large group of women in whom conception may occur with relative frequency only to terminate in spontaneous abortion may for practical purposes be considered infertile. Here again endocrine therapy appears to offer fascinating possibilities; yet it is generally believed that most causes of habitual abortion are not on an endocrine basis. A great percentage are attributable to defective germ plasm, local pelvic pathologic conditions, constitutional conditions, trauma and the like.[12] Of those attributable to hormonal disturbances, the exact etiologic mechanisms are obscure.

Because of the early experimental physiologic observations that corpus luteum hormone was responsible for maintaining the uterine musculature in a quiescent state during pregnancy, much therapy of habitual abortion has involved the use of corpus luteum hormone.[13] However, recent reports indicate that progesterone, alone, is not a particularly valuable agent in habitual abortion. Vaux and Rakoff,[14] for example, stated the opinion that, since both progesterone and estrogen play an important part in the maintenance of gestation, the use of either one of these alone is unphysiologic. They have advocated combined therapy with both progesterone and estrogens, starting as early as pregnancy is diagnosed and continuing until the period of viability. Both hormones may be given in one injection with a preparation which contains 10 mg. of progesterone and 1 mg. of estradial trimethyl acetate per cubic centimeter.[15] One cubic centimeter is given three times weekly.

Another point of view of endocrine therapy in habitual abortion has been advanced by Karnaky,[16] Smith and Smith and Hurwitz,[17] Greenhill [18] and others, who have used large doses of estrogens alone. Superficially, this would seem to contradict the known functioning, since estrogens are believed to stimulate uterine contractions. However, recent experiments provide some physiologic basis for such usage. Smith and Smith have demonstrated the important fact that in pregnancy diethylstilbestrol increases the production of corpus luteum hormone.

Kurzrok [19] has advocated the view that many cases of habitual abortion are associated with genital hypoplasia and that estrin administration promotes growth of the uterus, enabling it to keep pace with the developing fetus.

When used alone, diethylstilbestrol dosage is high. Greenhill [18] recommended 10 mg. daily, while Karnaky and others have advised at least 25 mg.

Thyroid Hypofunction.—It has been said, with perhaps some justification, that the use of thyroid substance has been the most important hormonal therapy of infertility. However, the exact value of thyroid is open to considerable conjecture. Despite the fact that numerous reports have appeared, advocating its routine use in sterility, regardless of the basal metabolic rate and other factors, the statistical evidence in favor of such usage is not too impressive. Reports giving cures in perhaps 30 per cent of patients given thyroid are subject to the criticism that the incidence of spontaneous cures in infertility may be nearly as high. Rabau, discussing therapy in sterility,[20] emphasized this fact in his series of 792 cases. Since thyroid is a routine measure so frequently, it may be given the credit for that which is in fact a spontaneous cure. Naturally, the same criticism holds for all types of therapy, but in the case of thyroid its commonplace usage makes it more suspect.

From the scientific point of view, thyroid extract should be given only in the presence of hypothyroidism. Such hypofunction can be diagnosed on the basis of clinical symptoms, basal metabolic rate, blood cholesterol and blood iodine. A slight decrease in the basal metabolic rate per se does not mean hypothyroidism. (Conversely, patients who appear somewhat

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13. Collins, G. C.; Weed. J. C., and Collins, J. H.: Surg., Gynec. & Obst. **70:** 783 (April) 1940. Browne, J. S. L.; Henry, J. S., and Venning, E. H.: Am. J. Obst. & Gynec. **38:** 927 (Dec.) 1939.
14. Vaux, N. W., and Rakoff, A. E.: Am. J. Obst. & Gynec. **50:** 353 (Oct.) 1945.
15. Supplied as Estrotate® (trimethyl acetic acid ester of alpha estradial in sesame oil) with progesterone.
16. Karnaky, K. J.: Am. J. Obst. & Gynec. **51:** 840 (June) 1946.
17. Smith, O. W.; Smith, G. V., and Hurwitz, D.: Am. J. Obst. & Gynec. **51:** 411 (March) 1946.
18. Greenhill, J. P.: Yearbook of Obstetrics and Gynecology, Chicago, The Year Book Publishers, Inc., 1946, p. 53.
19. Kurzrok, R.: New York State J. Med. **46:** 493 (March 1) 1946.
20. Rabau, E.: Harefuah **31:** 1 (Sept.) 1945.

hypothyroid clinically may not possess a significantly low basal metabolic rate.) The prescribing of thyroid solely on the basis of mild lowering of the basal metabolic rate, in the presence of all other evidences of normal thyroid function, is not justifiable.

It has been shown adequately that, while the administration of thyroid in normal persons may temporarily provide an increase in the basal metabolic rate, this increase will not persist, and with the same dosage the basal rate will revert to the original level or even lower.[21] Furthermore, when medication is discontinued, there is a period of reduced basal metabolic rate for several weeks before the return to its original level. This is attributable to the suppression of the patient's own thyroid function by the exogenous thyroid.

One feature of thyroid therapy which may to some extent explain its popularity is the fact that thyroid is a highly potent oral substance, and hence when given it "does something." However, by the same token, it must be emphasized that controlled studies of infertile patients who have been successfully treated with thyroid are few and far between. This should not be taken as disproportionately harsh criticism of thyroid therapy, but rather as an effort to emphasize that there is a definite question as to its routine value. The literature is correctly filled with much criticism of other endocrine preparations; yet thyroid seems to occupy a perfectly respectable place, despite the fact that injudicious use of this substance may be equally harmful.

On the other hand, if there is an element of hypothyroidism, it is logical to assume that the metabolic stimulus provided by thyroid administration may be just the impetus required to increase gonadal function to the fertile level.

Miscellaneous.—Endocrine preparations have been utilized in a variety of other conditions associated with infertility in the female, and certain of these seem to show promise. For example, estrogenic therapy was found to improve the viscosity and quality of cervical mucus,[22] and a combination of estrogens and sulfadiazine has been recommended as a substitute for cauterization in clearing up the chronic endocervicitis, which at times appears as an important barrier to conception.[23]

Estrogenic therapy has also been suggested in instances when tubal motility is not normal; it is felt that such therapy increases tubal peristalsis. Experimental work in connection with tubal spasm is also being conducted utilizing testosterone.

ENDOCRINE THERAPY IN THE MALE

The study of male infertility is still in its very early stages. The causes of many disturbances are obscure, and treatment is frequently unsatisfactory.

Two major conditions in which hormones may be involved in male disturbances are: (1) impotence and (2) defective spermatogenesis.

Impotence.—The ability to perform coitus, while a manifestation of endocrine normality, is also dependent on various neurogenic, psychogenic and mechanical factors. From the clinical point of view, the cause in the majority of cases of impotence is not primarily endocrine in origin and requires other therapy. In those cases in which the condition has an endocrine basis there will generally also be inadequate spermatogenic function, with other signs of hypogonadism. The majority of the patients have eunuchism or various stages of eunuchoidism. It is not common to see patients showing a combination of normal sperm production with impotence on the basis of hormone failure. In those patients in whom this does occur, rational treatment may be with the male hormone. The clinically effective dose of this substance is 25 mg. of testosterone propionate three times weekly. The equivalent oral dose is approximately 30 mg. of methyl testosterone, or 20 mg. given sublingually in the form of linguets.

Seminal Deficiency.—The majority of infertile husbands show normal ability to perform coitus, but have seminal deficiencies. Unfortunately, results of hormonal therapy in these cases are not encouraging. Stimulation of sperm production is directly dependent on secretion of the pituitary gonadotrophic hormone, follicle-stimulating hormone, the same hormone which produces follicular development in the female. Unfortunately again, the clinical experience with follicle-stimulating hormone preparations in the male are even more discouraging than in the female. If testicular biopsy is employed prior to therapy, many cases will be shown to merit no therapy because of irremediable damage to the seminiferous tubules.

The author has on occasion achieved some improvement in count by administration of gonadotrophic hormone in cycles and advising the patient to abstain from intercourse except at the period of the cycle during which ovulation may be expected to occur.[24] In that way, the best specimen may be obtained at the time when conception is most possible. There is, however, no evidence that spermatogenesis per se is improved in these patients to any substantial degree.

A new steroid, pregnenolone, has shown spermatogenic activity in experimental animals, but clinical investigation of this substance has failed to demonstrate significant therapeutic effectiveness.[25]

Testosterone propionate has been used frequently in the treatment of spermatogenic deficiencies, but such usage is not physiologic, since the male hormone does not directly stimulate activity of the seminiferous tubules. As a matter of fact, suppression of sperm production with the administration of large doses of testosterone has been reported. While this can undoubtedly occur, it is my impression that in the moderate dosage generally used, such suppression does not occur.

In instances in which the sperm count is fairly normal, but when motility may be somewhat impaired, small doses of testosterone may prove helpful by virtue of its effect on secretion of the prostate and other secondary sex glands. When used for this purpose, however, dosage should not exceed 10 mg. of testosterone propionate twice weekly or the equivalent in the form of methyl testosterone linguets.

The use of chorionic gonadotrophin in treating spermatogenic deficiency is not on a physiologic basis, since luteinizing hormone apparently has no effect on spermatogenesis.

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22. Pommerenke, W. T., and Viergiver, E.: J. Clin. Endocrinol. **6**: 99 (Jan.) 1946.
23. Dill, L. V.: Am. J. Obst. & Gynec. **54**: 1074 (Dec.) 1947.
24. Tyler, E. T., and Payne, S.: Spermatogenesis and Therapy of Infertility, J. A. M. A. **134**: 770 (June 28) 1947.
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The use of thyroid, in my opinion, should be limited to those patients who are hypothyroid, as discussed elsewhere in this paper.

Some investigators have stated the belief that in the male many gonadal deficiencies are fundamentally nutritional in origin and that treatment with substances other than hormones, such as vitamin B complex, desiccated liver and vitamin A, provides more therapeutic possibilities. Unfortunately, the correlation of histologic observations and therapeutic responses is still obscure, and, for the present, therapy in the male is largely a matter of general constitutional measures, hygienic habits, adequate diet and the like, with the use of hormones playing a relatively minor role in the present state of knowledge.

SUMMARY AND CONCLUSIONS

The physiologic relationships of the endocrine glands in reproduction are briefly outlined. The use of various endocrine preparations in some of the commonly treated aspects of infertility is discussed. The effectiveness of endocrine therapy in sterility is limited by the important facts that (*a*) the majority of cases of infertility are not endocrine in origin, (*b*) many of the preparations available are clinically ineffective and (*c*) exact diagnosis of some endocrine disturbances is difficult. There is no substitute for careful etiologic study of the patient, with therapy directed toward the specific factors observed.

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ABSTRACT OF DISCUSSION

DR. WILLARD O. THOMPSON, Chicago: The problem of infertility involves many factors, some anatomic and some hormonal. One of our duties as physicians is to attempt to improve the quality of the race. It would be interesting to know what type of offspring results from our efforts to make it possible for persons who are relatively infertile to conceive. Is the product as good as it is in persons who have no infertility problem? It is extremely important that studies be carried out to determine just what the end result is. The problem reverts to the fundamental functioning of the gonads and pituitary, all the factors involved in the regulation of menstruation and in the elaboration of good spermatozoa. One of the most important contributions that the studies on infertility have made is some increase in the knowledge of the function of the gonads and the glands of internal secretion that are related to them, notably the pituitary. It is very desirable to continue these studies. Although examination of the spermatozoa is relatively simple, most spermatozoa counts and most observations on spermatozoa are improperly performed and of relatively little value. One constantly sees patients who are said to have few spermatozoa, in whom, on examination, one finds normal spermatozoa counts and spermatozoa which are normal in every respect. Spermatozoa counts are not difficult, but the technic has to be carried out accurately. The female presents a more complex problem. Several types of abnormality may be found in the female, from the physical point of view, the congenital point of view and from the point of view of hormone disturbances. These can be accurately determined only by the most careful examination, which frequently involves careful hormone assays. Certain endocrine products are of definite value in the treatment of infertility. It is occasionally possible, with the pituitary gonadotropins available at the present time, to induce ovulation in women with an ovulatory menstrual cycle. I should like to emphasize what Dr. Tyler pointed out, namely, that desiccated thyroid has been very much abused in the treatment of sterile couples. Desiccated thyroid is primarily of value when hypothyroidism is present. There is a close relationship between the thyroid and gonads, but it is effective only when there is a definite thyroid deficiency, and I should like to decry the wholesale use of desiccated thyroid in the treatment of sterile persons. The American Society for the Study of Sterility considers the problem of infertility so important that it plans to establish a separate journal.

DR. EDWARD T. TYLER, Los Angeles: I wish to thank Dr. Thompson for his comments. I have been asked to say a few words about the enzyme hyaluronidase. I have used this substance clinically by packing it around the cervical os and also by adding it to the semen in artificial insemination. Results thus far do not appear to substantiate early clinical reports as to its therapeutic efficacy in certain types of infertility.

MODERN HISTORY OF PERIPHERAL NERVE SURGERY

World War II and the Postwar Study of Peripheral Nerve Regeneration

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It is perhaps a truism to state that the student of modern peripheral nerve surgery must be a student of military neurosurgery. Advances in this field, however, have always been directly related to two factors: (1) the decided increase in peripheral nerve injuries that always occurs as a result of war and (2) laboratory studies that have been embarked on because of the stimulus of problems that arise from this unusual mass of clinical material. For the purposes of this survey, the modern history of peripheral nerve surgery will be considered as starting in the latter part of 1942 and as reaching a clear end point with certain peripheral nerve regeneration studies now being conducted under the aegis of the National Research Council. This time limitation is admittedly an artificial one, and indeed the survey itself cannot be a complete one, but it covers a period in which some fifteen thousand peripheral nerve operations were performed and a later period in which at least an organized beginning was made in the objective study of the results of these procedures.

The general statement may be made that the recent progress of peripheral nerve surgery has rested more on a factual appreciation of the principles of nerve repair than on new methods of the technic of repair. There were, however, significant contributions to the age-long technical problem of securing an adequate end to end anastomosis, of overcoming large nerve defects by the implanting of a nerve graft and of controlling causalgic pain.

SUTURE MATERIAL

The search for an ideal suture material was initiated early in the war with the introduction of tantalum wire rolled into a 0.003 inch (0.008 cm.) diameter and swedged to curved needles of equal size. This metallic suture proved to be relatively inert in tissue but demanded considerable manual dexterity in its application. The use of very fine silk was preferable to tantalum in the repair of nerves of fine caliber, such as the digital. The potential value of the metallic suture

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Read in the Session on History of Medicine before the Section on Miscellaneous Topics at the Ninety-Seventh Annual Session of the American Medical Association, Chicago, June 25, 1948.

was immeasurably increased by the fact that the suture line could be visualized postoperatively by roentgenography of the site of anastomosis. This allowed the early fate of the integrity of the suture line to be followed at regular intervals and permitted the prompt recognition of suture line disruption. In a laudable effort to decrease the amount of tissue distortion at the suture line, and perhaps to decrease fibroblastic invasion at the point of anastomosis, several nonsuture methods of nerve repair were developed, notably the so-called plasma-glue suture. Its value was not fully delineated during the war experience, but it is reasonable to say that it is an auxiliary method of nerve repair to be used primarily in situations where suture line tension is minimal. One such situation is present when the adequate insertion of a nerve graft is contemplated.

NERVE GRAFTING

Perhaps no problem in this field has titillated the ambitions of neurosurgeons more than that of nerve grafting, and undoubtedly more energy and talent were expended on this matter than it deserved during these difficult years. When the human experiments in this field were assayed, it was obvious that man could not be considered as simple a creature histologically as could the rabbit, the cat or even the monkey. In the face of repeated successes in the experimental animal, whole fresh homografts and autografts of large nerves showed lack of clinical regeneration and histologic evidence of extensive fascicular necrosis and fibrous tissue replacement. The frozen-dried and rehydrated homograft of large nerves was promising and merits further trial as a longitudinally oriented bridge for the ingress of regenerating axons into the distal stump. There was sufficient laboratory and clinical evidence to show that the critical period of self sufficiency of the implant was quite short and that the reestablishment of the blood supply of the graft was of paramount importance. Since there existed much evidence of the success of single autografts in the grafting of small nerves, such as the facial and digital, the use of multistranded or cable autografts in the repair of injured nerves was a logical sequel of these observations. Since the strands of cutaneous sensory nerves used to form the cable graft were small, the use of the plasma glue technic of suture was advocated. A recent answer to this problem has been furnished in the affirmative by our English colleagues, but obviously much still remains to be done.

CAUSALGIA

No greater personal tragedy exists for the person with a major peripheral nerve injury than to have the pain of causalgia superimposed on his existing extremity dysfunction. The prewar years had demonstrated that such pain could be abolished by an appropriate denervation of the sympathetic nerve supply to the point of injury. The military experience in this field was fully exploited. Causalgia was found to appear in approximately 3 per cent of major nerve injuries and usually in instances of incomplete nerve division. In addition to the possible roles of vasospasm and local ischemia, direct cross stimulation of the sensory fibers by efferent sympathetic impulses at the point of nerve tissue injury was postulated as a theory that deserved serious consideration. Whatever the causation of this bitter pain may be, the relief by chemical or surgical interruption of the sympathetic nervous system occurred in such a high percentage of cases that failure could be explained only on the basis of inadequate denervation or the presence of neurosis or hysteria.

PROPER TIME FOR SUTURE

The difficulty of appraising the many variables affecting the recovery process in peripheral nerve injuries is at no point better illustrated than in the complex evaluation of the proper time at which to perform a definitive nerve suture. The evidence against primary or immediate or emergency nerve sutures in war injuries was almost incontrovertible, and the American point of view has been supported by British neurosurgical opinion. The contraindications to immediate suture proved to be the presence of infection, the technical difficulties of suture and nerve segment mobilization and, above all, the inability of the surgeon to evaluate exactly the extent of pathologic change in the respective nerve ends. To obviate these difficulties, the so-called early nerve suture was advocated with the sequence of events somewhat as follows: (1) debridement of the wound, with or without approximation of the visualized nerve segment by a fixation suture, and the start of antibiotic therapy, (2) delayed closure of the wound after infection has been delimited, (3) definitive nerve suture at a time when wound healing was complete, three to six weeks after the initial trauma, (4) judicious limb immobilization during transportation and after nerve suture, preferably by removable splints, and (5) preoperative and postoperative physical therapy. This time of definitive nerve suture, as compared with immediate nerve suture, was still early enough to obviate regressive changes in the distal nerve segment and in the denervated extremity as a whole. Normal wound healing occurred in 98 per cent of cases, and a study of the early course of regeneration disclosed suture line failure in but 5 per cent of the cases, as contrasted to 22.4 per cent of failure in the immediate nerve suture group. Similar results were reported from the Mediterranean Theater of Operations.

The transfer of this principle of nerve repair to civilian injuries caused by entirely different wounding mechanisms is a controversial issue at this moment, an issue perhaps confused by a too strict interpretation of the war injury sequence of procedures. In civilian injuries, debridement and primary skin closure can be carried out. The nerve injury may be treated but once at a time when a difficult tedious dissection can be initiated in a clean operative field, as an elective operation, in a thoroughly prepared patient. It is indisputably true that the trained neurosurgeon can carry out primary nerve suture with excellent results, granted that the patient is in a receptive mood and physical status commensurate with the task at hand. Unfortunately, the majority of peripheral nerve injuries occur and are treated in the absence of such specialists. The war experience has in part exploded the fallacy that a nerve injury is an emergency problem. It may soon even attain the respectable stature of an elective procedure, carried out at 8 o'clock in the morning by a rested and informed surgeon on a patient prepared for any eventuality.

PERIPHERAL NERVE REGISTRY

The Peripheral Nerve Registry of World War II was established by the Surgeon General on Nov. 22, 1944, with the twin purposes of studying neural regeneration during army hospitalization and at certain time

periods during the postwar era. By the end of hostilities, about 7,000 nerve sutures and nerve grafts had been registered and a statistical study of the basic data of the Registry had been compiled. This roster of patients and the desirability of follow-up in neural regeneration in the postwar period was presented to the Conference on Post-War Research held by the Division of Medical Sciences of the National Research Council on April 18, 1946. From this conference report stemmed two meetings of interested neurosurgeons, neurologists and neurophysiologists, which resulted in formal application being presented to the Committee on Veterans Medical Problems of the National Research Council for clinical research in this field, eventually entitled Project 13, "Follow-up Studies of Peripheral Nerve Injuries in Veterans." Study centers have been established in Boston, New York, Philadelphia, Chicago, San Francisco and Durham, N. C., with the simple and primary purpose of studying the varying aspects of neural regeneration in the war injured by the best of research methods. These study centers are functioning at the present time. This is one of the most ambitious and far reaching programs that have ever been devised for the study of peripheral nerve regeneration. Its objectivity is attested to by the fact that precision methods of study are being supervised by neurologists and neurophysiologists, none of whom have ever been responsible for actual surgical treatment or have ever used specific methods of treatment. On the other hand, in each center an experienced military neurosurgeon, some of whom are administrative heads of the center, will examine each case and add to the studies their knowledge of the conditions under which the wounds were suffered and the principles under which the patient received definite therapy. The final results of these endeavors will greatly influence military neurosurgery, in terms of both treatment and the disposition of wounded soldiers. One may also confidently expect that such studies will define in some detail the application of the wartime experience to the similar problems of peripheral nerve surgery encountered in civilian life.

CONCLUSION

Many years ago, Leonardo Da Vinci wrote these words about the peripheral nervous system, "The function of the nerve is to give a stimulus. They are the knights of the soul and have their origin from its seat, and command the muscles that move the members at the good pleasure of the soul."

Some of my colleagues who worked long and hard with these difficult injuries would feel that this were extravagant praise indeed. They would prefer never to have the subject mentioned again. Be that as it may, the study of this complex system is not complete; with the aid of modern research methods, the art of peripheral nerve surgery will continue to advance.

ABSTRACT OF DISCUSSION

DR. WILLIAM J. MIXTER, Boston: Dr. Woodhall failed to state that he himself is largely responsible for the advancement of our knowledge of peripheral nerve surgery. The other point I wish to make is that careful follow-up of patients with this group of nerve injuries will require the cooperation of all members of the medical profession who see these patients. It is essential that they be examined repeatedly. Therefore, the physician should urge that they report back for such examination.

ANGIOCARDIOGRAPHIC STUDY OF THE PULMONARY ARTERY

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Congenital and acquired heart disease, as well as pulmonary disease, produce significant changes in the size and configuration of the pulmonary artery and its branches. Because of the intimate relation of the artery to the heart and the mediastinal structures, recognition of these changes in roentgenologic study of the pulmonary artery has hitherto been difficult. Groedel's careful description of a probable aneurysm of the pulmonary artery [1] demonstrates convincingly the difficulties presented to the roentgenologist in the anatomic diagnosis of pathologic conditions of the pulmonary artery. With the presentation, in 1938, by Robb and Steinberg,[2] of a practical method of visualization of the cardiovascular system with contrast medium, the entire bed of the pulmonary artery became readily accessible to roentgenologic examination. Angiocardiography has indicated a wide variety of pathologic states which are manifested, in part, in abnormalities of the pulmonary artery. It is the purpose of this paper to present an angiocardiographic study of the normal and the pathologic pulmonary artery.

THE NORMAL PULMONARY ARTERY

The normal pulmonary artery is a short, broad vessel which arises from the conus arteriosus at the pulmonary semilunar valves to the left of the ascending aorta and then ascends, to the left and posteriorly, to a point below the aortic arch, where, just to the left of the spine, it gives off left and right main branches. The right branch passes posterior to the ascending aorta and the superior vena cava and anterior to the tracheal bifurcation, esophagus, thoracic duct and spine, to the hilus of the right lung, where it divides into superior and inferior branches. The left branch runs a short course to the hilus of the left lung; it is related posteriorly to the left main bronchus and the descending aorta and superiorly to the descending aortic arch, to which it is connected by the ligamentum arteriosum. Inferiorly, the right and left branches of the pulmonary artery are related to the pulmonary veins.

Though it is limited, conventional roentgenoscopy offers valuable information concerning the pulmonary artery. In frontal projection, the prominence immediately beneath the aortic knob is the shadow of the pulmonary trunk and its left main branch. This segment of the left cardiac border is abnormally prominent in dilatation of the pulmonary artery. In the lateral and both oblique projections, the upper anterior cardiac border is formed by the conus arteriosus and the pulmonary artery. The right auricular appendage plays

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Read before the Section on Radiology at the Ninety-Seventh Annual Session of the American Medical Association, Chicago, June 23, 1948.

This investigation was aided by a grant from the Schering Corporation, manufacturers of sodium iodomethamate (solution "neo-iopax"). The 75 per cent solution was used.

1. Groedel, F. M.: Aneurysm of the Pulmonary Artery, Radiology **33**: 219-231 (Aug.) 1939.

2. Robb, G. P., and Steinberg, I.: A Practical Method of Visualization of the Chambers of the Heart, the Pulmonary Circulation and the Great Blood Vessels in Man, J. Clin. Investigation **17**: 507 (July) 1938; Visualization of the Chambers of the Heart, the Pulmonary Circulation and the Great Blood Vessels in Man, Am. J. Roentgenol. **41**: 1-17 (Jan.) 1939.

a role in the formation of the upper anterior border in the left anterior oblique projection. In the lateral and left oblique projections, the right branch of the pulmonary artery is often recognizable as a rounded area of density within the hilar shadows. Similarly, the end on shadow of the left main branch may occasionally be recognized in the right anterior oblique projection. Dilatations of the pulmonary portion of the outflow tract may be recognized, in the lateral and oblique projections, in increased prominence of the upper anterior cardiac border and in a diminished retrosternal space. An enlarged pulmonary artery may indent the barium-filled esophagus; this may be viewed on lateral projection.[3]

Angiocardiography has established the validity of the preceding observations and disproved certain erroneous assumptions regarding the part of the pulmonary portion of the outflow tract in the composition of the normal cardiac contour. In angiocardiographic literature, the fact has been repeatedly emphasized that the pulmonary conus plays no role in the formation of the left cardiac border in frontal projection.[4] Visualization of the pulmonary artery and its branches, using contrast medium, affords precise, anatomic observations. In the frontal projection, the pulmonary artery may be seen as an almost vertical shadow, terminating superiorly in its bifurcation. The right branch is clearly demonstrated in its horizontal course to the hilus of the right lung. The left branch of the pulmonary artery "sits upon" the pulmonary trunk, curving downward as it enters the root of the left lung. The superior margin of the left branch of the pulmonary artery is regularly 1 to 2 cm. higher than that of the right branch. The conus arteriosus is not sharply outlined in the frontal projection, although its outer termination is often indicated by the sinus above the left pulmonary semilunar valve.

In the lateral and both oblique projections, the distinction between the pulmonary artery and the conus arteriosus can usually be made with certainty. The sinuses of the pulmonary semilunar valves are seen as localized dilatations of the pulmonary part of the outflow tract, while the anterior cusp of the pulmonary valve can often be identified. Distal to this point, the pulmonary trunk proceeds posteriorly, making up a portion of the anterosuperior cardiac border. The pulmonary trunk and the conus arteriosus are best seen in the lateral projection.

Angiocardiography affords accurate measurement of the caliber of the pulmonary trunk and the right main branch. Measured in 50 normal persons, the right main branch of the pulmonary artery, as it crossed the spine in frontal projection, varied from 17 to 30 mm. in caliber, averaging 23.4 mm. The pulmonary trunk ranged from 20 to 30 mm., averaging 26.4 mm., while the pulmonary conus ranged from 16 to 24 mm. and averaged 19.1 mm. These measurements were made in oblique and lateral projections; complete details were presented in a previous article.[4c] A slight, progressive increase with advancing age was noted in the caliber of the pulmonary artery.

THE PULMONARY ARTERY IN PATHOLOGIC CONDITIONS

Congenital Heart Disease.—Many of the commonly encountered, congenital cardiovascular abnormalities are manifested, in part, by morphologic or dynamic changes in the pulmonary artery. These changes, long recognized and well described in the literature of pathology and roentgenology, are best demonstrated in the living subject by means of angiocardiography. An abnormal pulmonary artery is present in every case of congenital "cyanotic heart disease." The most frequently observed change is that of dilatation of the pulmonary artery.

Primary or idiopathic dilatation of the pulmonary artery is less frequently encountered than secondary dilatation. Congenital lesions causing secondary or dynamic dilatation of the pulmonary artery include patent ductus arteriosus, septal defects (alone or in combination with other defects, as in Eisenmenger's syndrome) and pulmonic stenosis, wherein the artery is often widely dilated beyond the point of narrowing. The pulmonary artery may be small or absent in pulmonic stenosis (alone or in combination with other defects, as in the tetralogy of Fallot), in tricuspid atresia and in atresia of the pulmonary artery. Angiocardiography may be expected to reveal the pathologic anatomy of such congenital lesions as common truncus arteriosus, transposition of the great blood vessels, anomalous pulmonary arteries and veins and dextrocardia. Only those lesions commonly compatible with life beyond the first few years are included in our series.

Congenital Aneurysm of the Pulmonary Artery.—Idiopathic dilatation, or aneurysm, of the pulmonary artery is less rare a condition than has been previously supposed. Its recognition with angiocardiography is simple, and additional cases will probably appear in the literature with increasing frequency. In making the diagnosis, all other possible causes of dilatation of the pulmonary artery must be excluded, with clinical and roentgenologic means. We studied 2 cases of pronounced dilatation of the pulmonary artery in which no etiology other than congenital could have been implicated (fig. 1).

Septal Defect.—The relation between defects of the interatrial or interventricular septum and dilatation of the pulmonary artery is well known. Though either may cause dilatation, interatrial defects are more prone to cause pronounced dilatation of the pulmonary artery.[5] Probably the greatest secondary dilatation of the pulmonary artery occurs with an interatrial defect combined with mitral stenosis (Lutembacher's syndrome).[6]

Patent Ductus Arteriosus.—Dilatation of the pulmonary artery is the most common observation in the roentgenologic diagnosis of patent ductus arteriosus; it occurred in 41 of 50 proved cases reported by Donovan, Neuhauser and Sosman.[7] Steinberg, Grish-

3. Schwedel, J. B.: Clinical Roentgenology of the Heart, New York, Paul B. Hoeber, Inc., 1946.

4. (*a*) Robb and Steinberg.[3] (*b*) Weber, H. M.: Recent Advances in Roentgenology: Angiocardiography, Am. J. M. Sc. **205:** 747-753 (May) 1943. (*c*) Dotter, C. T., and Steinberg, I.: The Angiocardiographic Measurement of the Normal Great Vessels, Radiology, to be published. (*d*) Steinberg, M. F.; Grishman, A., and Sussman, M. L.: Angiocardiography in Congenital Heart Disease: Patent Ductus Arteriosus, Am. J. Roentgenol. **50:** 306-315 (Sept.) 1943. (*e*) Robb, G. P., and Steinberg, I.: Visualization of the Chambers of the Heart, the Pulmonary Circulation, and the Great Blood Vessels in Heart Disease, Am. J. Roentgenol. **42:** 14-37 (July) 1939. (*f*) Robb, G. P., and Steinberg, I.: Visualization of the Chambers of the Heart and the Thoracic Blood Vessels in Pulmonary Heart Disease: A Case Study, Ann. Internat. Med. **13:** 12-45 (July) 1939. (*g*) Sussman, M. L.; Steinberg, M. F., and Grishman, A.: Contrast Visualization of the Heart and Great Blood Vessels in Emphysema, Am. J. Roentgenol. **47:** 368, 1942.

5. White, P. D.: Heart Disease, ed. 3, New York, The Macmillan Company, 1946.

6. Taussig, H. B.: Congenital Malformations of the Heart, New York, The Commonwealth Fund, 1947.

7. Donovan, M. S.; Neuhauser, E. B. D., and Sosman, M. C.: The Roentgen Signs of Patent Ductus Arteriosus, Am. J. Roentgenol. **50:** 293-305 (Sept.) 1943.

man and Sussman drew attention to an elevation of the main and left pulmonary arteries in this condition.[4d] Our data are similar to these observations. In addition, we observed opacification of the ductus itself, with reopacification of the pulmonary artery. Figure 2 illus-

Fig. 1.—Congenital aneurysm of the pulmonary in a patient of 35 years; left lateral projection. SVC, superior vena cava. RV, right ventricle. PC, conus (conus arteriosus). PA, pulmonary artery. Note aneurysmal dilatation of the pulmonary trunk and its branches.

trates the reopacification of a dilated, elevated pulmonary artery in a case of clinically established patent ductus arteriosus. Angiocardiography in this case ruled

Fig. 2.—Patent ductus arteriosus in a patient of 29 years; frontal projection, ten seconds after injection. The aorta (AO) is opacified, and the reopacified, dilated pulmonary artery (PA) is outlined.

out the presence of septal patency and, in addition, revealed a localized dilatation of the descending aorta at the point of origin of the ductus, a sign first described by Steinberg, Grishman and Sussman.[4d]

Eisenmenger's Syndrome.—The combination of interventricular septal defect, dextroposition of the aorta and a dilated or normal pulmonary artery, known as the Eisenmenger complex, is not amenable to surgical treatment. This is in contradistinction to the tetralogy of Fallot, where pulmonic stenosis is present and where great relief may be obtained with the surgical creation of a "shunt" from a peripheral artery to the hypotensive bed of the pulmonary artery. The angiocardiographic demonstration of a dilated pulmonary artery and pulmonary conus is a contraindication to an aortic-pulmonary anastomosis.

Pulmonic Stenosis.—Pulmonic stenosis is clearly revealed angiocardiographically; the exact location of the point of narrowing may be demonstrated. Stenosis usually occurs in combination with other anomalies but is often seen as an isolated lesion. In 2 patients, both of whom were noncyanotic, pulmonic stenosis was demonstrated angiocardiographically as an isolated lesion. In one case (fig. 3) the stenosis was infundi-

Fig. 3.—Infundibular pulmonic stenosis in a patient of 30 years; left lateral projection. Arrows embrace the point of stenosis below the pulmonary semilunar valves. Note distal dilatation of the pulmonary artery (PA) and its branches.

bular, while in the other case (fig. 4) the site of narrowing was above the valve. Demonstrated in both cases was a dilatation of the pulmonary artery distal to the point of stenosis, often observed in coarctation of the aorta.[8]

Tetralogy of Fallot.—Angiocardiographic visualization of the site of pulmonic stenosis in the tetralogy of Fallot should invariably be accomplished before operative intervention. As well as in ruling out the presence of the clinically similar Eisenmenger's syndrome and in confirming the diagnosis of septal defect and dextroposed aorta, angiocardiography is of great value in demonstrating to the surgeon the exact anatomic structure of the defect he plans to correct. In this manner, unnecessary delay during the actual, time-consuming operation may be avoided. In no other congenital cardiac abnormality is angiocardiography of such great value to the patient as in the tetralogy of Fallot.

8. Grishman, A.; Steinberg, M. F., and Sussman, M. L.: Contrast Roentgen Visualization of Coarctation of Aorta, Am. Heart J. **21**: 365-370 (March) 1941.

Figure 5 demonstrates the appearance in a case of tetralogy of Fallot.

Rheumatic Heart Disease.—Mitral stenosis due to rheumatic fever causes enlargement of specific chambers of the heart and, thereby, imparts characteristic changes to the silhouette. Among these are enlargement of the left atrium and enlargement of the right ventricle and its outflow tract, including the pulmonary artery and its branches. As has been previously reported, the pulmonary artery and its left main branch make up the prominence in the left upper cardiac border (viewed in the frontal projection), frequently observed in mitral stenosis.[9] In our series, dilatation of the pulmonary artery was not so important as elongation of the outflow tract of the right ventricle in producing this prominence. Rotation of the heart to the left and backward, which occurs secondary to the enlargement of the right ventricle, also contributes to the apparent prominence of the pulmonary artery, as it causes the aortic knob to become less prominent.

Fig. 4.—Congenital pulmonic stenosis above the pulmonary valve in a patient aged 28 years; left lateral projection. Arrow indicates stenosis, distal to pulmonary semilunar valves. Note dilatation of the pulmonary artery (PA) and its branches, distal to stenosis.

Not invariably present, though often striking, in mitral stenosis is dilatation of the pulmonary trunk and its branches. Figure 6 shows dilatation of the left pulmonary artery in a patient who had clinically established and roentgenographically typical mitral stenosis. We agree that the earliest change in mitral stenosis which can be observed roentgenologically is an enlarged left atrium [10] and have made angiocardiographic observations of normal pulmonary arteries in the presence of enlarged left atria due to mitral stenosis. Disease of the aortic valve in the absence of cardiac failure had no effect on the pulmonary artery in our series. Cardiac failure, regardless of its etiology, may result in dilatation of the bed of the central pulmonary artery as well as in the familiar congestion of the pulmonary vessels.

9. Robb and Steinberg [4e] Grishman, A.; Sussman, M. L., and Steinberg, M. F.: Angiocardiographic Analysis of Cardiac Configuration in Rheumatic Heart Disease, Am. J. Roentgenol. **51**: 33-43 (Jan.) 1944.
10. Parkinson, J., and Hartley, R.: Early Diagnosis of Rheumatic Valvular Disease in Recruits, Brit. Heart J. **8**: 212-232 (Oct.) 1946.

Syphilis.—Syphilis of the pulmonary artery is similar to, less common than and generally accompanied by syphilis of the aorta. The disease may affect the major pulmonary arteries in the form of arteritis not unlike that of the aorta, with intimal thickening and destruction of the elastica. Although overemphasized, syphilitic endarteritis of the lesser branches of the pulmonary artery does occur and may occasion secondary atheromatous changes in the main branches,

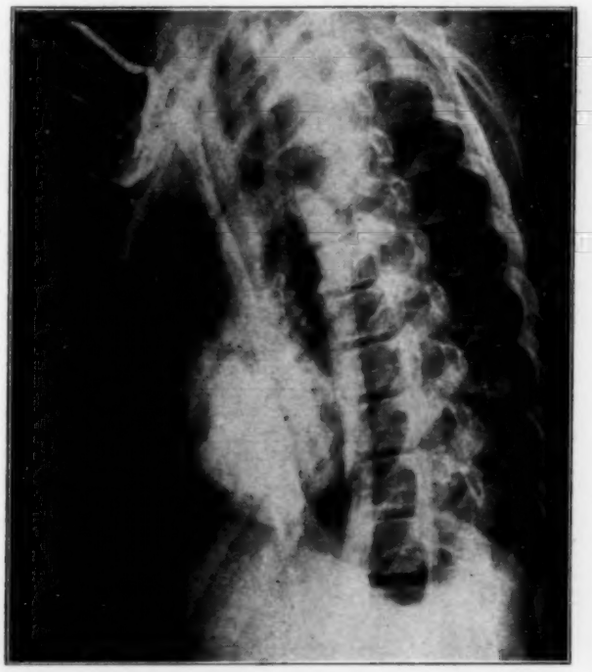

Fig. 5.—Tetralogy of Fallot in a patient aged 9 years; left anterior oblique projection, two seconds exposure. Note simultaneously opacified large right ventricle and small left ventricle and the aorta, which was overriding. The pulmonary artery was decidedly stenotic and did not fill. (Diagnosis confirmed at operation.)

Fig. 6.—Rheumatic mitral stenosis in a patient of 46 years; left lateral projection, with barium in esophagus. Note enlarged right ventricle and dilated pulmonary artery, which are filled with sodium iodomethamate. The enlarged left atrium is outlined in negative contrast.

with ultimate pulmonary hypertension and cor pulmonale.[11] Clinically and roentgenographically, however, syphilis of the pulmonary artery is usually manifested in the form of an aneurysm. Including 2 cases of their own, Boyd and McGavack were able to collect only 35 cases of syphilitic aneurysm of the pulmonary artery or its main branches in which the diagnosis had been proved by autopsy.[12] Angiocardiographic demonstration of aneurysm of the pulmonary artery is convincing. Sussman recently reported an angiocardiographically visualized aneurysm of the pulmonary artery, of presumably syphilitic origin.[13] Figure 7 shows an aneurysm of the pulmonary artery in a patient with clinically and angiocardiographically established syphilitic aortitis. The pulmonary artery or conus arteriosus may be obstructed by a syphilitic dilatation of the ascending aorta. Garvin and Siegel presented results of clinical and pathologic examinations in 3 such cases, which progressed to cor pulmonale and death.[14]

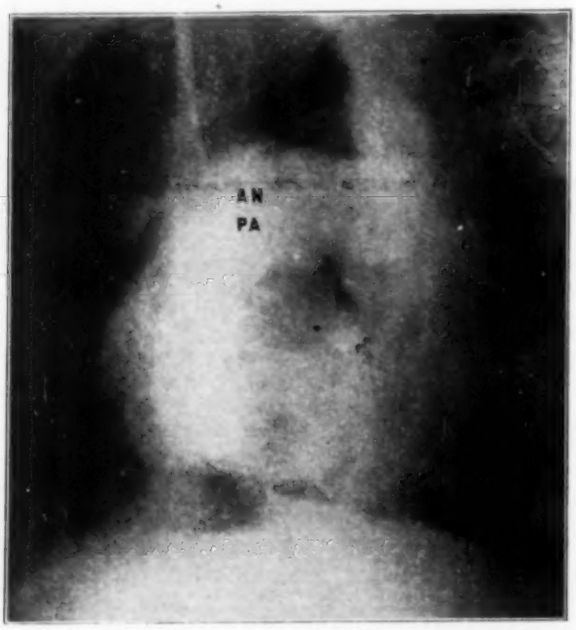

Fig. 7.—Syphilitic aneurysm of the pulmonary artery in a patient aged 60 years; left anterior oblique projection. ANPA, aneurysm of the pulmonary artery and its main branches.

Pulmonary Heart Disease.—It is generally accepted that chronic pulmonary disease is the principal cause of cor pulmonale. Robb and Steinberg reported in detail the angiocardiographic observations in a case of chronic pulmonary fibrosis and emphysema,[4f] while Sussman, Steinberg, and Grishman reported similar evidence in 28 cases of pulmonary emphysema.[4g] Although chronic obstructive emphysema is the most frequent cause of chronic cor pulmonale, silicosis, bronchiectasis, tuberculosis, bronchial asthma, kyphoscoliosis or primary sclerosis of the pulmonary artery (Ayerza's disease) may be associated with the changes of pulmonary heart disease. These changes are similar, regardless of the etiology or dynamics involved. We have observed hypertrophy of the right side of the heart associated with emphysema, pulmonary fibrosis, extensive fibrotic pulmonary tuberculosis, bronchiectasis, silicosis, chronic obstruction of the conus arteriosus by aortic aneurysm, kyphoscoliosis and primary sclerosis of the pulmonary artery.

In the presence of chronic pulmonary hypertension, the earliest change observed angiocardiographically was elongation of the pulmonary outflow tract, including both the conus arteriosus and the pulmonary artery, followed by moderate dilatation of the bed of the pulmonary trunk. Concomitant dilatation and hypertrophy of the right ventricle occur, usually causing the pulmonary artery to swing to the left and assume a more prominent position in the left upper border of the heart. Absolute enlargement of the right ventricle is often recognizable, while, in some instances, a bulge of the interventricular septum toward the left has been of help in identifying enlargement of the right ventricle.[4g]

The New York Heart Association requires the presence of "evidence of cardiac insufficiency with marked cyanosis" for the diagnosis of pulmonary heart disease.[15] Rheumatic valvular disease may be diagnosed long before cardiac failure is present, and it would seem logical to proceed similarly in the case of cor pulmonale. The presence of cyanosis should be no more necessary in the diagnosis of cor pulmonale than the presence of calcification of the mitral ring is necessary in the diagnosis of mitral stenosis.

Other Secondary Abnormalities of the Pulmonary Artery.—A variety of other intrathoracic abnormalities alter the configuration of the central pulmonary arterial system. Mediastinal or pulmonary tumors, primary or metastatic, may encroach on or distort the main branches of the pulmonary artery. Angiocardiographic evidence of actual stenosis, or occlusion, of a major pulmonary artery due to a tumor is usually evidence that the lesion is advanced and probably inoperable. The detailed vascular pattern in pulmonary tumors is being studied at the time of writing.

Kyphoscoliosis causes stretching and distortion of the cardiovascular structures, often bringing about enlargement of the right side of the heart and dilatation of the pulmonary artery, secondary to obstructive emphysema and extremely inefficient functioning of the lungs. After thoracoplasty and pneumothorax, a decrease in the caliber of the pulmonary artery supplying the collapsed side has been noted repeatedly in our series of cases. After pneumonectomy, a secondary dilatation of the branch of the pulmonary artery supplying the remaining lung has been observed. Such secondary or dynamic dilatation or diminution of the pulmonary artery is comparable to compensatory hypertrophy or atrophy of disuse in general, and is in agreement with the results of studies on the functioning of the lungs.[16] Angiocardiographic visualization of the abnormal pulmonary artery in these conditions is satisfactory and superior to other methods of structural investigation.

Frequently, in the course of conventional roentgenoscopic examination of the chest, prominent shadows

11. Hare, D. C., and Ross, J. M.: Syphilitic Disease of the Pulmonary Arteries, Lancet **2**: 806-812 (Oct. 14) 1939.
12. Boyd, L. J., and McGavack, T. H.: Aneurysm of the Pulmonary Artery: Review of Literature and Report of Two New Cases, Am. Heart J. **18**: 561-572 (Nov.) 1939.
13. Sussman, M. L.: The Differentiation of Mediastinal Tumor and Aneurysm by Angiocardiography, Am. J. Roentgenol. **57**: 584-590 (Nov.) 1947.
14. Garvin, C. F., and Siegel, M. L.: Cor Pulmonale Due to Obstruction of the Pulmonary Artery by Syphilitic Aortic Aneurysms, Am. J. M. Sc. **198**: 679-685 (Nov.) 1939.
15. Nomenclature and Criteria for Diagnosis of Diseases of the Heart, ed. 4, New York, New York Heart Association, 1945, p. 22.
16. Andrus, W. D.: Observations on the Cardiorespiratory Physiology Following the Collapse of One Lung by Bronchial Ligation, Arch. Surg. **10**: 506-519 (Jan.) 1925. Bloomfield, R. A.; Lauson, H. D.; Cournand, A.; Breed, E. S., and Richards, D. W.: Recording of Right Heart Pressures in Normal Subjects and in Patients with Chronic Pulmonary Disease and Various Types of Cardio-Circulatory Disease, J. Clin. Investigation **25**: 639-664 (July) 1946.

are observed in one or both hilar regions and the problem of differential diagnosis arises. Angiocardiography easily differentiates between enlarged hilar vessels and nonvascular structures, such as enlarged hilar lymph nodes or tumors. The identity of rounded hilar shadows and hilar vessels seen end on may be established by visualization with contrast mediums. It may be difficult to distinguish aneurysm of the descending aorta from dilatation of the left main branch of the pulmonary artery without the aid of angiocardiography.

SUMMARY

A survey of the pulmonary artery and its main branches in normal and abnormal conditions, utilizing the angiocardiographic material and the experience accumulated over an eleven year period, has been presented. The value of angiocardiography in arriving at early and anatomically precise diagnoses of conditions affecting the pulmonary artery has been stressed and illustrated.

Visualization with contrast medium has proved itself indispensable in the diagnosis of congenital cardiac lesions. Angiocardiographic visualization of the pulmonary artery should be utilized in every case of tetralogy of Fallot prior to surgery, in order that surgical method may be correctly planned, unproductive approaches avoided and valuable time saved. No longer need exact anatomic diagnosis of congenital lesions of the heart originate at autopsy. Angiocardiographic evidence of a lesion is often as convincing proof as pathologic examination, and it has the advantage of being applicable to the living patient.

The earliest change observed angiocardiographically in mitral stenosis has been enlargement of the left atrium, followed infrequently with enlargement of the pulmonary artery and the right ventricle. This is in accordance with conventional roentgenoscopic observations. With the aid of angiocardiography, aneurysmal dilatation of the pulmonary artery may now be identified with ease, and data on factors responsible for such dilatations may be clarified. In our series, dilatation of the pulmonary artery was seen to be caused by congenital and acquired diseases of the heart and chest. Congenital lesions included patent ductus arteriosus, septal defects (more pronounced dilatation resulted from interatrial, as opposed to interventricular, defects), idiopathic aneurysmal dilatations, the Eisenmenger complex and pulmonic stenosis. Dilatation of the pulmonary artery and its major branches was also seen in the presence of mitral stenosis, congestive cardiac failure, chronic pulmonary disease and kyphoscoliosis. It is suggested that the diagnosis of pulmonary heart disease can be made far in advance of the appearance of cyanosis, not only with angiocardiographic methods but also with conventional roentgenoscopy, and it is suggested that the official criteria for the diagnosis of this condition are in need of modification.

The value of angiocardiography in the preoperative diagnosis of pulmonary and mediastinal tumors has been discussed. It is often possible to establish angiocardiographically the inoperability of tumors which have spread to the mediastinum and altered the configuration of the great blood vessels. Changes occurring in the bed of the pulmonary artery after artificial pneumothorax or pneumonectomy have been demonstrated and are in accordance with physiologic principles.

CONCLUSIONS

While conventional roentgenography of the pulmonary artery is often difficult, inadequate and anatomically vague, angiocardiographic visualization is simple, adequate and anatomically precise. The angiocardiographic configuration of the normal pulmonary artery is outlined, as are the changes present in cardiac, mediastinal and pulmonary disease. These changes are considered academically and from the standpoint of improved diagnosis. Angiocardiography is indispensable in the preoperative investigation of congenital cardiac disease and facilitates exact anatomic diagnosis, often otherwise impossible during life.

ABSTRACT OF DISCUSSION

DR. HARRY M. WEBER, Rochester, Minn.: This might well be considered a decennial presentation, for it was at the session of the American Medical Association in San Francisco in June 1938, before the Section on Pharmacology and Therapeutics, that Dr. Steinberg and Dr. Robb made their first report on the practical method they had developed of visualizing the chambers of the heart, the pulmonary circulation and the great blood vessels in man. As Dr. Dotter pointed out, angiocardiography is practically indispensable in the diagnosis of certain cardiovascular abnormalities, especially congenital ones for which, in recent years, a satisfactory surgical therapy has been developed. I refer especially to the diagnosis of the tetralogy of Fallot and its accurate differentiation from the Eisenmenger complex, the clinical indications of which are so similar. Frequently, too, the exact anatomic situation may be demonstrated with angiocardiography, demonstrated as in patent ductus arteriosus and in coarctation of the aorta, conditions in which, with conventional clinical and roentgenologic methods, diagnosis may be made but the exact pathologico-anatomic situation remains unknown, or at least poorly estimated, preoperatively. Dr. Dotter and Dr. Steinberg are now interested in applications of the method and in certain mechanical improvements to facilitate roentgenography at the proper intervals after the contrast solution is administered. I wish to thank Drs. Steinberg and Dotter for this excellent and instructive presentation. It has not only enlarged our diagnostic vista, but also done much to clarify and correct our notions about the use and limitations of our more conventional roentgenologic procedures in cardiovascular diagnosis.

DR. FRED J. HODGES, Ann Arbor, Mich.: Having read the paper and having seen in the original the superb illustrations that Dr. Dotter prepared for us, it is too bad that they were shown under very trying conditions. His films must be studied at some length in order to appreciate their true worth. The paper by Drs. Dotter and Steinberg goes far beyond earlier contributions in the field of angiocardiography. This morning we have been shown broad and highly practical applications of the technic. In particular, the utility of angiocardiography in the study of acquired heart disease is promising. To be able to identify cor pulmonale in advance of late cardiac failure is distinctly worthwhile. Dr. Dotter's illustrations represent complete mastery of the technical procedures which, of necessity, are of an exacting type. At my institution there has been constructed a considerably modified, multiple exposure x-ray camera, based on the principle introduced by Dr. Hans Jarre, of Detroit, many years ago. This apparatus makes it possible to prepare a succession of direct roentgenograms on a continuous strip of film, 8 inches wide. Frames for individual exposures are 8 by 10 inches. Exposures can be made at the rate of five per second. Technical experience at the institution thus far is meager, but I am convinced that the apparatus will be of considerable use in cardiography and that, once there is thorough familiarity with its technic, angiocardiography will find frequent applications in daily practice. Experimental runs on dogs, as well as results obtained for the relatively few patients examined thus far, have indicated that smaller, rather than larger amounts of opaque material would be desirable in demonstrating the relationships of cardiovascular structures.

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I should like to ask Dr. Dotter if, in his experience, it is desirable or necessary to inject as much as 40 cc. of the contrast medium.

DR. LEO RIGLER, Minneapolis: After seeing this beautiful demonstration, I am reluctant to introduce any discordant note, but I wish to emphasize that, while angiocardiography certainly is a method of study which permits us to learn a great deal about congenital heart diseases and diseases of the pulmonary arteries, one must not be overwhelmed by the brilliant detail presented in these films and develop an inferiority complex about conventional methods of diagnosis. I think it is possible, particularly in the noncyanotic types of congenital heart disease, to make an accurate diagnosis without angiocardiography in the overwhelming majority of cases if all the diagnostic factors, including, of course, meticulous roentgenologic studies, are considered. In cyanotic heart disease, I believe that angiocardiography may well be necessary in a much larger percentage of the cases. I was most interested in Dr. Dotter's statement about pulmonic stenosis, and should be gratified to know the basis for his impression that isolated pulmonic stenosis is not rare. My only experience, in a large series of autopsies in cases of congenital heart disease of all kinds and descriptions, is that isolated pulmonic stenosis of the type found in the tetralogy of Fallot is very rare. This is of some importance in the question of whether true pulmonic stenosis, without associated defects and, at least, in its relatively early stages, actually can produce cyanosis. I should like to reemphasize Dr. Dotter's criticism of the criteria which have been given for the diagnosis of cor pulmonale. It has been my experience that the diagnosis of cor pulmonale can be made in a great many cases long before right heart failure has occurred. If one carefully studies cases of bronchial asthma, silicosis or tuberculosis, the enlargement of the right side of the heart, first indicated by enlargement of the pulmonic artery, becomes apparent long before the symptoms of actual failure, such as cyanosis and ascites, appear.

DR. J. E. MILLER, Dallas, Texas: Dr. Dotter has indicated that his cases of the Eisenmenger complex were not amenable to aortic-pulmonary anastomosis. I have 4 or 5 patients in whom I have made this diagnosis from angiocardiography, and the same may be true of them. In 1 of the patients, however, where most of the contrast material went into the pulmonary artery, instead of the aorta, the clinicians were not entirely satisfied that my impression of the Eisenmenger complex was correct. The patient was operated on, with the plan of measuring pressures in the pulmonary artery. The clinicians had indicated that anastomosis would be done provided the pressure was less than 350 mm. of water. The measurements indicated that the pressure was 300 mm. of water, plus or minus 20. The anastomosis was made, and the result was excellent. Since I have other patients with the same angiocardiographic diagnosis, there will be a clinical reevaluation; perhaps some of them will be operated on. We should not say that anastomosis is not applicable when the diagnosis of Eisenmenger's complex has been made angiocardiographically.

DR. CHARLES T. DOTTER: We have seen at least 2 cases of pulmonic stenosis in adults in whom we were unable to demonstrate any other cardiovascular lesion. We believe it a more common condition than formerly recognized and anticipate that studies employing catheterization of the heart will bear this out. In our experience, the diagnosis of Eisenmenger's syndrome should be made angiocardiographically only when a large, dilated, nonstenotic pulmonary artery can be demonstrated. The decision regarding operative intervention rests solely upon the shoulders of the surgeon. In closing, may I comment upon the undeserved reputation which angiocardiography has gained, namely, that it is a difficult procedure. It can be accomplished with very little special equipment, making use of a standard cassette with which one obtains only two films during an injection. All the films which you have seen today were made in that manner. For the other details of technic, may I refer you to the papers of Drs. Robb and Steinberg, published in 1938 and 1939.[2] The details have changed very little since then. I believe that angiocardiography will grow to be a commonplace method of examination, employed in all hospitals and in the hands of many radiologists.

RETROLENTAL FIBROPLASIA

Incidence in Different Localities in Recent Years and a Correlation of the Incidence with Treatment Given the Infants

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and
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Boston

Retrolental fibroplasia (R. L. F.) is an ocular disease usually associated with prematurity and usually affecting both eyes. The most conspicuous diagnostic sign is the presence of a membrane, often vascularized, situated behind the crystalline lens. The presence of blood vessels in the membrane serves to differentiate retrolental fibroplasia from congenital cataract. The affected eye may be smaller than normal, the anterior chamber shallow and the ciliary body abnormally serrated. Secondary changes, such as synechiae, glaucoma and iritis, frequently develop. The disease is rarely, if ever, seen at birth but develops when the infant is between 1 and 5 months of age. It has been seen to start as a dilatation of the retinal vessels followed by exudative retinitis and subsequent retinal detachment.[1]

Retrolental fibroplasia was first associated with prematurity by Terry[2] in 1942. Since then there have been indications that the incidence has increased more in some localities than in others. The apparent increase in the frequency of the disease in recent years cannot be explained by the statement that the condition in a significant number of cases was formerly undiagnosed and therefore missed[3] or that a significantly greater proportion of premature infants survives now than in 1942.[4] To date, no satisfactory theory of the cause of retrolental fibroplasia has been proposed. It seems likely, however, that if it were demonstrated that the incidence of the disease were actually increasing, or that the incidence varied significantly from place to place, the possible number of explanations would be greatly reduced. Moreover, it might be feasible, from a knowledge of the incidence in any one locality over a period of years, or in various localities, to correlate the incidence with some factor associated with mother or infant at one particular time or place. Accordingly, studies were made of the number of premature infants born in particular hospitals in various localities, in whom retrolental fibroplasia did or did not develop. The results to be reported show that the incidence, at least in some localities, has increased and that this increased incidence correlates positively with certain treatment given to the infant, although,

From the Departments of Ophthalmology and Obstetrics and the Howe Laboratory of Ophthalmology, Harvard Medical School; the Massachusetts Eye and Ear Infirmary; the Boston Lying-in Hospital, and the Providence Lying-in Hospital. Supported by a grant from the Foundation for Vision for the study of retrolental fibroplasia.

Mrs. Harriet D. Parish and the staffs of the record rooms and social service departments of the Boston Lying-in and Providence Lying-in hospitals gave assistance in this study; Drs. Stewart Clifford and Clement Smith gave advice and suggestions in reporting the results of the study and outlining the new vitamin and iron medication schedule to be used at the Boston Lying-in Hospital.

1. Owens, W. C., and Owens, E. U.: Retrolental Fibroplasia in Premature Infants, Tr. Am. Acad. Ophth. **53**: 18-38 (Sept.-Oct.) 1948.

2. Terry, T. L.: Extreme Prematurity and Fibroblastic Overgrowth of Persistent Vascular Sheath Behind Each Crystalline Lens, Am. J. Ophth. **25**: 203-204 (Feb.) 1942.

3. The fact that cases of retrolental fibroplasia were not recognized in former years cannot alone account for the present apparent rise in incidence, because the number of children born since 1942, in certain localities at least, whose vision is seriously impaired by retrolental fibroplasia far exceeds the number of cases of blindness occurring in former years which could possibly be attributed to this condition.

4. The survival rate of premature infants at the Boston Lying-in Hospital has not increased significantly during the past sixteen years. Values reported for other hospitals (Dunham, E. C.: Premature Infant, Children's Bureau Publication 325, United States Department of Labor, Children's Bureau, 1948) suggest that any increased survival rate is small compared with the apparent increase in incidence of retrolental fibroplasia.

as indicated later, this correlation does not constitute proof of causal relation between incidence and treatment.

PREVIOUS STUDIES

Previous reports of the incidence of retrolental fibroplasia (with the exception of the report of Owens and Owens [1] at the Johns Hopkins Hospital in Baltimore and that of Gilger [5] at the Cincinnati General Hospital, to which detailed reference will be made later) have been preliminary in nature. Ingalls,[6] quoting a personal communication from Clifford and Allers, stated that at the Boston Lying-in Hospital, between 1938 and 1945, the incidence of the disease for 254 infants, weighing less than 4 pounds (1,814 Gm.) at birth, is 13 per cent. He mentioned, however, that 4 of the infants with retrolental fibroplasia weighed more than 4 pounds at birth, in which case the incidence rate for infants weighing less than 4 pounds at birth appears to be approximately 11 per cent. He pointed out, also, that the estimate is probably conservative because of "missed" cases. The number of babies successfully investigated is not given, and Ingalls concluded that the stated incidence rate must be considered approximate.

Clifford and Weller [7] (quoting a personal communication from Allers) said that the incidence in the same nursery in Boston was 23 per cent for infants weighing between 2 and 3 pounds (907 and 1,361 Gm.) at birth. The number of infants on which this figure is based and the period of time covered are not given.

Others who have studied retrolental fibroplasia, including Krause [8] and Reese and Payne,[9] have not investigated the relative frequency of the disease in children born prematurely, although Krause reported that it has occurred in 1 out of 4,000 births at the Chicago Lying-in Hospital. The period covered by the data is not given.

METHODS

Inquiries [10] were sent to parents or guardians of all infants born at the Boston Lying-in Hospital and Providence Lying-in Hospital who weighed 4 pounds or less at birth, to establish the present condition of their eyes. Responses were obtained concerning 93 and 95 per cent of all infants in these two locations, respectively. When an ocular defect was reported, the children were seen by an ophthalmologist who gave the diagnosis in any cases of retrolental fibroplasia. The information used in correlating incidence of the disease and factors relating to the mothers and infants was taken from the hospital records, and frequently additional information was obtained from the mothers and pediatricians concerning the treatment of the infant after discharge from the hospital.

5. Gilger, A. P.: Retrolental Fibroplasia in Prematurely Born Children, Am. J. Ophth., to be published.
6. Ingalls, T. H.: Epidemiology of Encephalo-Ophthalmic Dysplasia, J. A. M. A. **138**: 261-264 (Sept. 25) 1948.
7. Clifford, S. H., and Weller, K. F.: The Absorption of Vitamin A in Prematurely Born Infants With Experience in the Use of Absorbable Vitamin A in the Prophylaxis of Retrolental Fibroplasia, Pediatrics **1**: 505-511 (April) 1948.
8. Krause, A. C.: Congenital Encephalo-Ophthalmic Dysplasia, Arch. Ophth. **36**: 387-444 (Oct.) 1946.
9. Reese, A. B., and Payne, F.: Persistance and Hyperplasia of Primary Vitreous, Am. J. Ophth. **29**: 1-19 (Jan.) 1946.
10. The data for the New York Hospital were collected by Dr. Lewis Fraad, and the diagnoses were made under the supervision of Dr. John McLean of the Department of Ophthalmology of the Cornell Medical School. The information concerning the Cincinnati General Hospital and the Hartford Hospital was supplied by Dr. Anita P. Gilger and Dr. A. C. Unsworth, respectively, and will be reported by each in detail elsewhere. The study at the Johns Hopkins Hospital in Baltimore was made by Drs. William and Ella Owens. The data concerning the Colorado General Hospital in Denver were supplied by Dr. Lula O. Lubchenco and Dr. Harry H. Gordon; those for the Michael Reese Hospital in Chicago, by Dr. Julius Hess and Miss Evelyn C. Lundeen; those for Birmingham, England, by Dr. V. Mary Crosse of the Public Health Department of Birmingham.

RESULTS

The results of the study for the Boston Lying-in and Providence Lying-in hospitals and those of Gilger for Cincinnati are shown in a series of 9 graphs in which the data are presented for each year studied. The first figure for each place shows the birth weights of infants in whom retrolental fibroplasia developed, plotted as a scattergram. The second figure presents in percentage the incidence of the disease for all of the children and the incidence, separately, for those infants weighing less than 3 pounds and those who weigh between 3 and 4 pounds at birth. The third figure shows the actual number of cases of retrolental fibroplasia, the number of children in whom this disease did not develop and, indicated by a line above the blocks, the number of children about whom no information could be obtained.

TABLE 1.—*Incidence of Retrolental Fibroplasia (R. L. F.) in Various Localities*

	<3 Lb. (1,361 Gm.)			3-4 Lb. (1,361-1,814 Gm.)				
	Children with R.L.F.	Normal* Children	Incidence, Percentage	Children with R.L.F.	Normal Children	Incidence, Percentage	Years	Fraction Investigated, Percentage
Boston	9	35	20.5	1	105	0.95	1938-1942	85
Boston	10	28	26.3	33	129	20.2	1943-1947	97
Providence, R. I.	7	23	23.3	9	186	4.6	1941-1947	92
Baltimore	0	23	0	0	63	0	1935-1944	33 (est.)
Baltimore	4	29	12.1	1	38	2.5	1945-1947	?
Hartford, Conn.	4	3	57	4	24	14.3	1948	100
New York	5	60	7.7	1	141	0.7	1939-1946	83
Cincinnati	2	20	9.1	5	69	6.8	1943-1947	62
Birmingham, England	0	21	0	0	83	0	1945	100
	<3 Lb. (1,361 Gm. (est.)			3-3 Lb. 5 Oz. (1,361-1,500 Gm. (est.)				
Denver	2	8	20	0	4	0	1948	67
	<2.8 Lb. (1,260 Gm.)							
Chicago †	5	211	2.3	..	...	....	1922-1947	97

* Normal in all tables indicates simply the absence of retrolental fibroplasia.

† It will be observed that the data given for the Chicago hospital (Michael Reese Hospital) cover a twenty-five year period. The ages of the 5 patients with retrolental fibroplasia were 2, 3, 5, 7 and 16 years (4 females, 1 male), indicating that the incidence of the disease has been and still remains low.

The data from the other cities are not presented graphically because either the number of cases of retrolental fibroplasia was too small or the period of time covered in the studies was too short. They are included, however, in this report (table 1), since they represent the only available information at this time on the incidence of this disease.

Boston.—There were 372 infants weighing 4 pounds or less at birth and surviving six months or more, who were born at the Boston Lying-in Hospital during the years 1938 through 1947. Of these, it was found that retrolental fibroplasia had developed in 53 and had not developed in 298; 21 could not be located. In 44 of the cases of retrolental fibroplasia, both eyes were affected; in 9, one eye only was affected. From figures 1, 2 and 3 it is evident that the incidence of the disease had increased during the second five years of the period studied (1943 through 1947), and that this increase is accounted for chiefly by an increase in cases among the heavier infants (3 to 4 pounds). Figure 3 shows that only 1 case of retrolental fibroplasia occurred in 102 premature infants weighing

between 3 and 4 pounds at birth (1.0 per cent) prior to 1943, whereas in the same weight group there were 33 cases in 162 premature infants (20 per cent) in the years 1943 through 1947. The incidence during the same two periods in infants born in this hospital who weighed less than 3 pounds at birth (table 1)

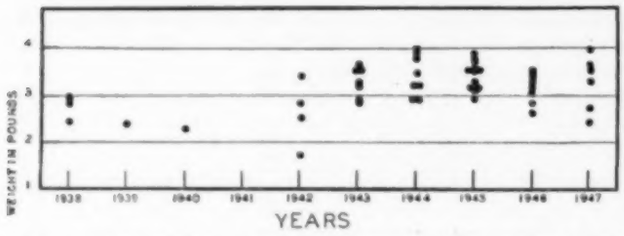

Fig. 1.—Birth weights of premature infants in whom retrolental fibroplasia developed who were born at the Boston Lying-in Hospital.

was 20.5 and 26.3 per cent, respectively. The year to year fluctuation in the incidence of the disease in the lighter group of infants (figure 3) may be explained by the small number of infants in this weight group.

Providence.—There were 246 infants weighing less than 4 pounds at birth and surviving six months or more, who were born at the Providence Lying-in Hospital during the years 1941 through 1947. Of these, it was found that retrolental fibroplasia had developed in 16 and had not developed in 218; 12 could not be located. In 14 of the cases of retrolental fibroplasia both eyes were affected; in 2, one eye only was affected. Figure 4 shows that, unlike the situation at the Boston hospital, the retrolental fibroplasia occurred in the 3 to 4 pound weight group with approximately the same frequency throughout the period of study. Figure 5 shows that the total incidence of the disease has not varied significantly throughout the eight year period. The high incidence observed in the light weight group during the years 1942 through 1944 is not significant because of the small number of infants in this group (fig. 6).

Cincinnati.—There were 156 infants weighing less than 4 pounds at birth, presumably living at the time the survey was made, who were born at the Cincinnati General Hospital during the years 1943 through 1947. Of these, it was found that retrolental fibroplasia had developed in 7 and not in 89; 60 could not be located.

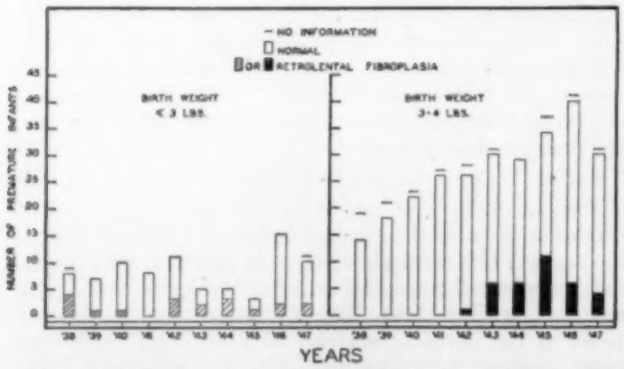

Fig. 2.—The number of premature infants born at the Boston Lying-in Hospital (top line), the number of cases of retrolental fibroplasia (cross hatch for the birth weight group under 3 pounds and solid blocks for the birth weight group 3 to 4 pounds) and the number of premature infants known to be normal with respect to retrolental fibroplasia (open blocks).

The number of cases of retrolental fibroplasia in children born at this hospital is too small to permit any conclusions with regard to distribution by years.

Other Cities.—The data regarding the incidence of retrolental fibroplasia for other cities are summarized and presented in table 1, along with a similar condensation of the data for the three cities already reported. The table shows that the incidence in the infants weighing less than 3 pounds at birth is higher in every location (where any cases of retrolental fibroplasia exist) than it is in the group weighing 3 to 4 pounds at birth. It shows also that there is a considerable variation in the incidence in different localities.

The data thus far presented suggest that the incidence of retrolental fibroplasia has increased in recent years, particularly in the 3 to 4 pound weight group in the Boston hospital. The question arises as to whether any particular factor or factors associated with the mothers or infants can be correlated with the increased

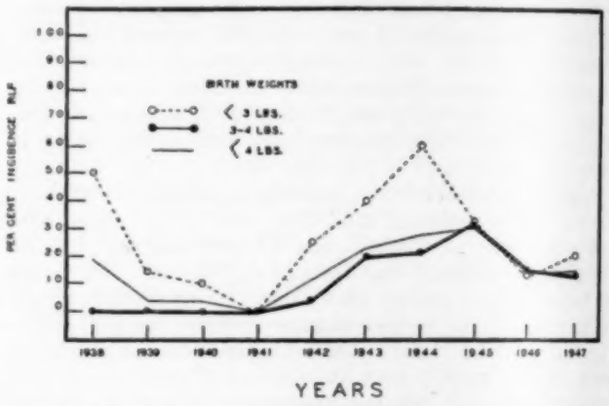

Fig. 3.—The incidence of retrolental fibroplasia in premature infants born at the Boston Lying-in Hospital.

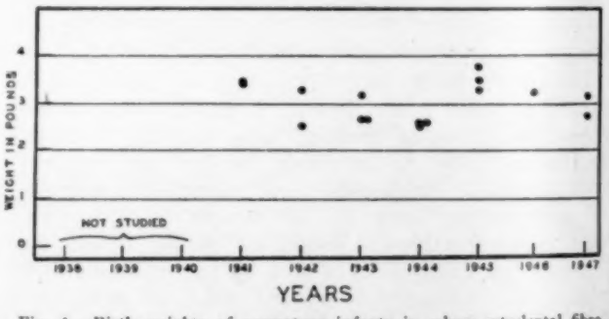

Fig. 4.—Birth weights of premature infants in whom retrolental fibroplasia developed who were born at the Providence Lying-in Hospital.

incidence of the condition. Those factors affecting the mothers or infants may be divided into two classifications. The first (tables 2 through 13) includes those factors affecting some mothers or some infants throughout the ten year period studied. The second includes those factors which either were absent entirely or varied significantly from one part of the study period to another, but which applied to all cases, once initiated.

In the first classification it is possible to determine whether the incidence of retrolental fibroplasia in any particular group is different from that in the total group. The factors considered are:

Parity (table 2)
Age of mother (table 3)
Rh type (table 4)
Type of delivery (table 5)
Analgesic administered (table 6)
Anesthesic administered (table 7)
Causes of prematurity (table 8)

Single or multiple births (table 9)
Sex of the infant (table 10)
Presence of congenital abnormalities (table 11)
General information (table 12)
Miscellaneous (table 13)

There appears to be a significant correlation between the incidence of retrolental fibroplasia and only two of the aforementioned factors. The first of these is seen in table 2, which shows that the incidence of retrolental fibroplasia in offspring of primiparous women (45 per cent of the total) was 9.5 per cent compared with 19.7 per cent in those of multiparous women. This difference in incidence may be said to be significant, since the probability that it would occur by chance is much less than 1 in 100. The number of cases involved in each parity group above 1, taken separately,

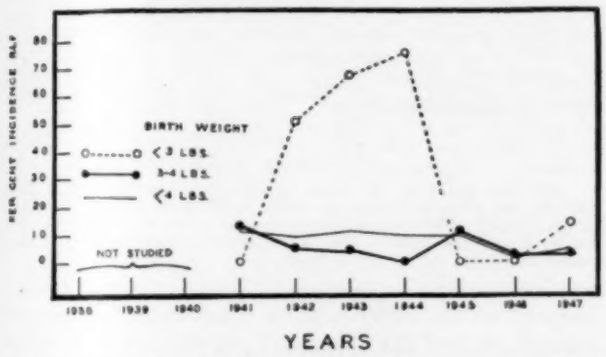

Fig. 5.—The incidence of retrolental fibroplasia in premature infants born at the Providence Lying-in Hospital.

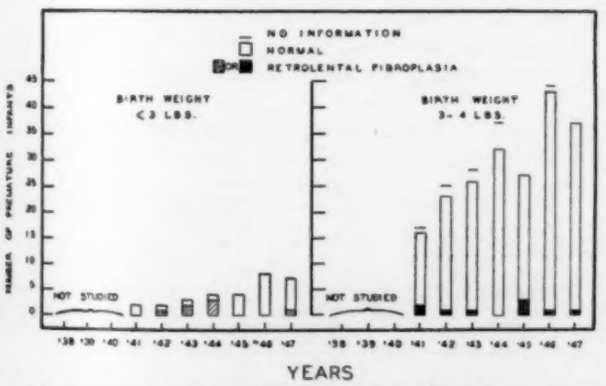

Fig. 6.—The number of premature infants born at the Providence Lying-in Hospital (top line), the number of cases of retrolental fibroplasia (cross hatch for the birth weight group under 3 pounds and solid blocks for the birth weight group 3 to 4 pounds) and the number of premature infants known to be normal with respect to retrolental fibroplasia (open blocks).

is too small to determine whether the incidence rises progressively with parity.

The second instance of possibly significant correlation is seen in table 12, which shows that infants in whom retrolental fibroplasia subsequently developed remained in the nursery, water jacket incubator and in oxygen for longer periods than the infants in whom retrolental fibroplasia did not develop. This suggests that the general health of the infants in whom retrolental fibroplasia subsequently developed may have been poorer than of those whose eyes remained normal, or possibly that the latter were larger infants requiring a shorter stay in the hospital.

The distribution of cases of retrolental fibroplasia according to sex is also of possible significance. Table 10 shows that the disease occurs more frequently in male (14.0 per cent) than in female (9.2 per cent) subjects. The probability that this distribution would occur by chance is between 1 in 10 and 1 in 20. The distribution by sex at the Boston hospital was approximately constant from year to year, except for 1945,

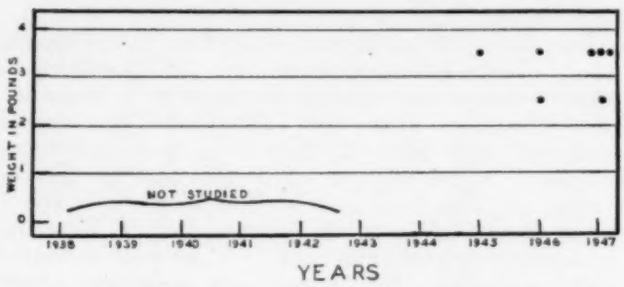

Fig. 7.—Birth weights of premature infants in whom retrolental fibroplasia developed who were born at the Cincinnati General Hospital.

in which year all 12 cases of retrolental fibroplasia occurred in male subjects. The probability that this would occur by chance, considering the average incidence in all of the years in male and female subjects in the Boston hospital, is less than 1 in 1,000,000. We are unable to account for the distribution by sex in

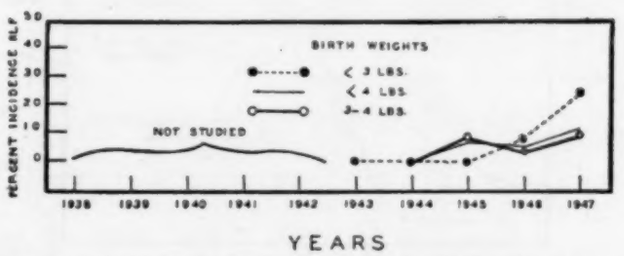

Fig. 8.—The incidence of retrolental fibroplasia in premature infants born at the Cincinnati General Hospital.

this year, or for the much higher incidence observed in 1945 compared with that in the years 1943, 1944, 1946 and 1947.

Gilger (Cincinnati), who has similarly attempted to correlate incidence with factors affecting mothers or infants, found no correlation between the incidence of

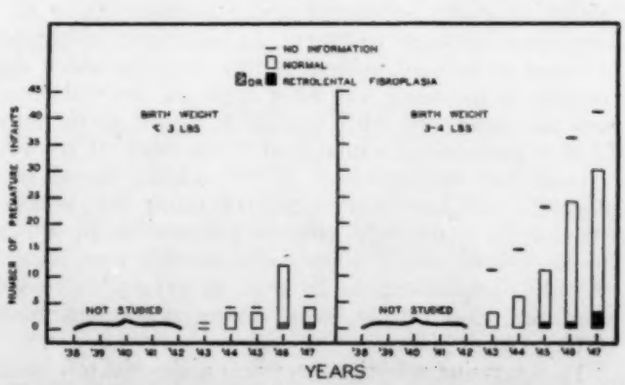

Fig. 9.—The number of premature infants born at the Cincinnati General Hospital (top line), the number of cases of retrolental fibroplasia (cross hatch for the birth weight group under 3 pounds and solid blocks for the birth weight group 3 to 4 pounds) and the number of premature infants known to be normal with respect to retrolental fibroplasia (open blocks).

the disease and the age of the mother, frequency of uterine bleeding, virus infections during pregnancy, chronic illness during pregnancy, causes of prematurity

or race. She found, as we did, a probable positive correlation between the parity of the mothers and the incidence of retrolental fibroplasia, since all 7 of the cases of the condition which she reports occurred in infants of multiparous mothers. The probability that this would occur by chance is 1 in 10. She did not investigate the length of stay in the hospital and other such factors.

The use of the analgesic meperidine hydrochloride was the only factor of those thus far considered in which there was any appreciable variation in frequency of administration in one part of the period investigated compared with another. This drug was used more frequently in the last five year period and was administered to 77 mothers in 166. The incidence of retrolental fibroplasia in infants born to mothers receiving meperidine hydrochloride was 23.5 per cent compared with an incidence of 19 per cent in infants whose mothers did not receive the drug. This difference is not significant.

The second classification, viz., the factors which changed from one part of the 1938 through 1947 period compared with another part, and which once initiated affected all infants, will now be considered. As mentioned previously, the most striking instance of

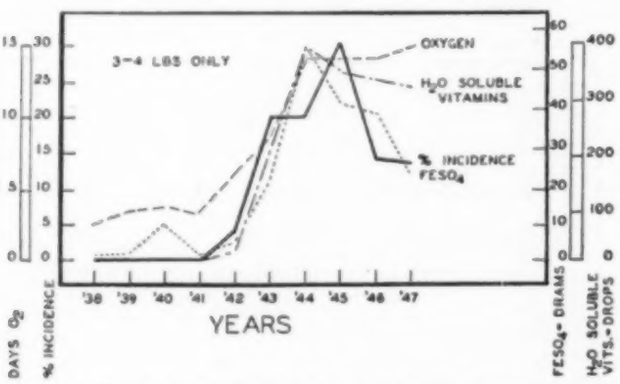

Fig. 10.—Correlation between the incidence of retrolental fibroplasia in premature infants born at the Boston Lying-in Hospital, and the administration of oxygen, ferrous sulfate (1 dram contains 1 grain, 65 mg. iron sulfate) and vitamin supplements given in a water-miscible form.

increased incidence (fig. 2) occurred during the second half (1943 through 1947) of the ten year period in infants weighing between 3 and 4 pounds. Since any correlation between treatment and incidence might be expected to be most evident in this group in which the increase in incidence was most apparent, the following data are concerned with this birth weight group only (3 to 4 pounds). Examination of the hospital records showed that the treatment of the infants varied significantly with time in three respects only: first, administration of a multiple vitamin preparation in which the fat-soluble vitamins are made miscible with water; secondly, administration of iron in greatly increased quantities, and thirdly, more frequent administration of oxygen.

To determine whether there was a significantly positive correlation between the increased incidence and the use of any or all of these three agents, the average actual amount administered per infant per hospital stay was plotted along with the incidence of the disease for the same period. This method of representing the data is necessarily arbitrary, but since all three forms of treatment were used for essentially all of the infants, this method of averaging seems to represent a valid method for comparing change in incidence with change in quantity of the agent administered. From figure 10 it may be seen that the incidence rises along with the total amount of the water-miscible vitamin preparation and the total amount of iron given. The graphs also show that the maximum

TABLE 2.—*Parity,* Boston Lying-in Hospital*

Para	Normal Children	Children with R.L.F.	Incidence, Percentage
1	143	15	9.5
2	67	13	16
3	33	13	28
4	20	4	17
5	13	4	24
6	5	0	0
7	1	1	50
8	5	1	17
9	4	0	0
10	1	0	0
Over 10	1	1	50
Unreported	5	1	17
Total multiparas	150	37	19.7
Total	298	53	15.1

* The percentage of the total group of premature infants whose mothers were primiparas does not differ significantly from the percentage of the total number of term babies born of primiparous mothers. This was true also for mothers who gave birth to their second and third, fourth and fifth, sixth child or more.

quantity of the water-miscible vitamin preparation and iron given and the maximum incidence of retrolental fibroplasia do not correspond precisely. The correlation between rise in incidence and dosage is less striking for oxygen than for the water-miscible vitamin preparation and for iron.

Additional information concerning the possible correlation between the three forms of treatment considered herein and the incidence of retrolental fibroplasia can be obtained by comparing the treatment with respect to these three items and the incidence of the condition in other localities where sufficient data regarding treatment are available.

TABLE 3.—*Age of Mother, Boston Lying-in Hospital*

Years	Normal Children	Children with R.L.F.	Incidence, Percentage
16-25	89	14	14
26-35	146	27	16
36-45	52	10	16
Unreported	11	2	15
Total	298	53	15.1

TABLE 4.—*Rh Type,* Boston Lying-in Hospital*

Type †	Normal Children	Children with R.L.F.	Incidence, Percentage
Rh +	67	16	19
Rh −	13	5	28

* Years 1945, 1946 and 1947 only.

† In the white population the distribution according to Rh type is 85 per cent Rh positive and 15 per cent Rh negative. The distribution found here in normal persons is 84 per cent Rh positive and 16 per cent Rh negative, and the distribution in infants with retrolental fibroplasia is 76 per cent Rh positive and 24 per cent Rh negative. In this small sample there is no deviation from the normal either with respect to the normal infants or those in whom retrolental fibroplasia developed.

Table 14 (3 to 4 pound weight group only) presents data concerning the administration of water-miscible

vitamins [11] and iron given infants in the hospitals studied in other cities in comparison with that given at the Boston hospital. For comparative purposes in the table, the quantities are listed as zero when not given, and higher or lower than the middle range of quantities used at the Boston hospital.

From this table it can be seen that the incidence is 1 per cent or less in those hospitals in which low doses of iron were given either without vitamins in water-miscible form (Boston 1938 through 1942, New York, Birmingham) or with vitamins in this form in low dosages (Baltimore). The incidence is intermediate (between 1 and 20 per cent) in those hospitals in which iron or the amount of water-miscible vitamin preparation used is high (Cincinnati and Providence, group 1, respectively). These data, therefore, show that in cities other than Boston there is also some degree

TABLE 5.—*Type of Delivery, Boston Lying-in Hospital*

Type	Normal Children	Children with R.L.F.	Incidence, Percentage
Breech	64	12	17
Transverse	7	5	42
Low forceps	84	6	7
Cesarian	37	10	21
Normal	153	22	13
Unreported	12	0	0
Average incidence			15.1

TABLE 6.—*Analgesic Administered, Boston Lying-in Hospital*

Analgesic	Normal Children	Children with R.L.F.	Incidence, Percentage
Amobarbital	29	4	12
Meperidine hydrochloride	78	23	22.8
Phenobarbital	51	8	13.5
Magnesium sulfate	46	6	12
Morphine	27	6	18
Pentobarbital sodium	35	2	5
Pantopon *	31	7	18
Paraldehyde	16	5	24
Scopolamine	147	29	16
"Seconal sodium" (sodium 5-allyl-5-[1-methylbutyl] barbiturate)	112	21	16
Average incidence			15.1

* A proprietary preparation containing the total opium alkaloids in the form of soluble hydrochlorides.

of positive correlation between the incidence of retrolental fibroplasia and the quantity of vitamins given in a water-miscible form or the amount of iron administered. A possible exception to this correlation may be seen from the second group at Providence, where no water-miscible vitamins were administered, but the incidence of retrolental fibroplasia was 4 per cent—an intermediate value.[12] In evaluating the results of such a comparison it is necessary to keep in mind that the regimen may be altered after the infant is sent home. Accurate information concerning home care is difficult to obtain.

We believe that, so far as the factors cited herein may operate to increase the incidence of retrolental fibroplasia, they do so indirectly and not through a direct toxic effect. This belief is supported by the observation that the incidence of the condition in infants under 3 pounds was much less influenced by the presence or absence of these factors from one locality to another, although the incidence was higher than in the heavier infants (3 to 4 pounds). One may suppose that, all other factors remaining constant, an added influence of some kind may be necessary before retrolental fibroplasia develops in any significant number of the heavier infants. The primary mechanism, however, presumably is the same in both weight groups.

TABLE 7.—*Anesthetic Administered, Boston Lying-in Hospital*

Type	Normal Children	Children with R.L.F.	Incidence, Percentage
Gas	52	14	21
Ether	107	18	14
Vinyl ether	13	7	35
Spinal	98	16	14
Average incidence			15.1

TABLE 8.—*Causes of Prematurity, Boston Lying-in Hospital*

Cause	Normal Children	Children with R.L.F.	Incidence, Percentage
Spontaneous delivery	178	32	15
Precclampsia	76	10	12
Premature separation of placenta	31	8	20
Placenta previa	17	5	23
Premature rupture of membranes	44	7	14
Hydramnios	5	0	0
Unreported	13	0	0
Average incidence			15.1

TABLE 9.—*Single and Multiple Births, Boston Lying-in Hospital*

Type	Normal Children	Children with R.L.F.	Incidence, Percentage
Single	230	42	15.4
Twins	63	11	14.9
Triplets	5	0	0
Total	298	53	15.1

TABLE 10.—*Sex of the Infant in Various Localities*

	Male			Female		
	Normal Children	Children with R.L.F.	Incidence, Percentage	Normal Children	Children with R.L.F.	Incidence, Percentage
Boston	127	24	15.9	171	29	14.5
Providence, R. I.	95	11	10.3	114	5	4.2
Cincinnati	37	7	15.9	52	0	0
Total	259	42	14.0	337	34	9.2

Some comment is in order regarding the difference between the administration of vitamins in water-miscible form and in other forms. Lewis and his co-workers [13] and Clifford and Weller [7] have shown that the

11. Each drop of the standard preparation used at the Boston hospital provided on the average: vitamin A, 500 units; thiamine, 0.1 mg.; riboflavin, 0.1 mg.; ascorbic acid, 5 mg.; vitamin D, 100 U.S.P. units, and niacinamide, 0.5 mg.

12. Two of the 4 children with retrolental fibroplasia in Hartford (table 1) were also known never to have received iron or vitamins in a water-miscible form. Data are not available at present concerning treatment administered the children in this group in whom retrolental fibroplasia did not develop.

13. Lewis, J. M., Bodansky, O., Birmingham, J., and Cohlan, S. Q.: Comparative Absorption, Excretion, and Storage of Oily and Aqueous Preparations of Vitamin A, J. Pediat. **31**: 496-508 (Nov.) 1947.

absorption of vitamin A by premature infants when the vitamin is given in a water-miscible form is much higher than it is from an oil-soluble preparation.[14] An infant, therefore, may be capable of absorbing more vitamin A from a water-miscible preparation of 5,000 units of vitamin A than from an oil-soluble preparation of 15,000 units. The water-soluble vitamins presumably are equally well absorbed whether administered in water or accompanying vitamins A and D in the water-miscible form. If, then, the administration of vitamins in a water-miscible form plays a part in increasing the incidence of retrolental fibroplasia, vitamins A or D are probably the ones involved. Since the solvent of the water-miscible preparation used in Boston has been changed several times during the period in which it was used, without a significant change in the incidence of retrolental fibroplasia, it is presumably innocuous. In all the hospitals not using the water-miscible preparation, vitamin A was administered in doses of about 15,000 units per day in an oil preparation, except in Boston in the years 1938 through 1942 when no vitamin A was given.

TABLE 11.—*Presence of Congenital Abnormalities, Boston Lying-in Hospital*

Abnormalities	Normal Children	Children with R.L.F.	Incidence, Percentage
Hemangioma	12	2	14
Umbilical hernia	17	0	0
Congenital heart disease	12	0	0
Undescended testes	11	1	8
Hydrocephalus	3	0	0
Other head deformities	6	0	0
Malformed genitalia	8	3	27
Others	13	2	12
Average incidence			15.1

TABLE 12.—*General Information, Boston Lying-in Hospital*

Item	Days	
	Normal Children	Children with R.L.F.
Average period in nursery	46	56
Average period in water jacket incubator	12	19
Average period in oxygen	12	21

The use of cow's or breast milk for feeding in various localities is difficult to correlate with the incidence of retrolental fibroplasia, since in many hospitals the use of breast milk varies so much with the available supply. Nevertheless, from the data which are available the incidence of this condition does not appear to correlate with the differential use of cow's and breast milk.

CONCLUSIONS

In certain areas the incidence of retrolental fibroplasia has increased significantly in recent years. In Boston, where the data are most complete, the rise in incidence was found chiefly in the 3 to 4 pound (1,361 to 1,814 Gm.) weight group. The greater frequency of retrolental fibroplasia correlates with several changes in treatment of premature infants; i. e., use of vitamin supplements in water-miscible form and increased use of iron. While a positive correlation between rise in incidence of the disease and change in treatment does not constitute proof of any causal relation between the two, nevertheless it is suggestive that the medication used may be of etiologic significance.

To test this possibility, we, in conjunction with the staffs of the Boston Lying-in and certain other hospitals, are planning to investigate the effect on the incidence of retrolental fibroplasia of omitting the iron and also the multiple vitamin preparation in water-miscible form. It is planned to withhold the iron until the premature infant is between 2 and 3 months of age and substitute for the multiple vitamin preparation vitamin D alone, in a water-miscible form (1,000 units daily). In addition, the diet will be supplemented with 50 to 100 mg. of vitamin C daily. No vitamin A or vitamin B-complex will be given. The results of this study will be made available as soon as a sufficient number of infants has been tested to permit statistically valid conclusions concerning the true role of the aforementioned forms of treatment in producing retrolental fibroplasia.

This study has been concerned wholly with premature infants whose birth weights were less than 4 pounds (1,814 Gm.). The incidence of retrolental fibroplasia in heavier premature infants and in term babies has not been investigated, but, from the number of known cases of the disease in such infants, it must be extremely low. Before one draws inferences regarding possible harmful effects from the use of water-miscible vitamin preparations or iron in treating heavier premature infants or term babies, one should consider these facts.

TABLE 13.—*Miscellaneous Factors, Boston Lying-in Hospital*

Factor	Normal Children	Children with R.L.F.	Incidence, Percentage
Complete blood cell count (baby)	99	17	15
X-ray (baby)	67	13	16
X-ray (mother)	111	25	18
Transfusion (baby)	28	9	24
Clysis (baby)	32	8	20
Nonocular infection (baby)	56	13	19
Eye infection (baby)	35	6	15
Infection (mother)	74	16	18
Average incidence			15.1

TABLE 14.—*Correlation of Treatment with Incidence in 3-4 Pound Weight Group*

	Years	Multiple Water-Miscible Vitamin Preparation *	Iron *	Incidence of R.L.F., Percentage
Boston	1938-1942	0	L	0.9
Boston	1943-1947	H	H	20.2
Baltimore	1935-1947	L	L	1.0
New York	1939-1946	0	0	0.7
Cincinnati	1943-1947	0	H	6.8
Birmingham, England	1945	0	L	0
Providence, R. I.	1938-1947	H	L	5.2
Providence, R. I.	1938-1947	0	L	4.0

* The quantities are listed as zero when not given, and higher (H) or lower (L) than the middle range of quantities used at the Boston hospital.

14. The use of the vitamin supplement in water-miscible form was inaugurated at the Boston Lying-in Hospital in 1943 to increase the amount of vitamin A absorbed by the premature infant. This therapy was instigated as a result of studies by Warkany (Warkany, J.: Congenital Malformations Induced by Maternal Nutritional Deficiency, J. Pediat. **25**: 476-480 [Dec.] 1944) in which it was shown that a disease resembling retrolental fibroplasia in many respects could be produced in young rats born of mothers who were deficient in vitamin A.

Clinical Notes, Suggestions and New Instruments

STREPTOCOCCUS FAECALIS REACTION OCCURRING DURING STREPTOMYCIN THERAPY

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and
OVELIA L. BALDRIDGE, M.D.
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The occurrence of a Streptococcus faecalis reaction during streptomycin therapy was clinically diagnosed in 20 patients in a series of 300.

The symptoms, in most cases, occurred during the third or fourth week of streptomycin therapy and consisted of beginning nausea, abdominal distention, vertigo, increase in pulse rate, a rise in temperature from 100 to 104 F. (oral) and a leukocyte count between 12,000 and 23,000. These symptoms were not an allergic manifestation, as sometimes seen during streptomycin therapy, nor were they toxic symptoms, i.e., vestibular dysfunction, renal irritation or blood dyscrasia.

We believe that these symptoms were caused by a decided increase in the number of fecal streptococci, as all symptoms promptly disappeared when penicillin was added to streptomycin therapy, thus restoring the intestinal flora to normal. This opinion was substantiated by the studies of the intestinal flora following streptomycin therapy by Price and his co-workers[1] of the Food and Drug Administration, Washington, D. C., which reveals, ". . . it is apparent that when rats are fed on a diet containing streptomycin, there appears in a relatively short time in the feces large numbers of microorganisms which are extremely resistant to this antibiotic. These organisms are mainly the fecal streptococci. . . . Since the feces of both groups of rats which had streptomycin in their diet showed markedly greater numbers of these same organisms in their feces, it would appear that streptomycin had the effect of stimulating the growth of these resistant organisms. The demonstration of the stimulation of the growth of an organism (hormesis) by streptomycin was previously reported (Welch *et al.*, 1946). . . . The stimulation phenomenon may be of considerable importance in the treatment of diseases due to both streptomycin-sensitive and streptomycin-resistant organisms."

These 30 patients with the Strep. faecalis reaction received 1 Gm. of streptomycin every day in divided doses subcutaneously. We know that streptomycin is not absorbed through the intestinal mucosa, but that approximately 2 per cent appears in the feces, probably coming by the way of the bile.

It is important, therefore, to differentiate a Strep. faecalis reaction from an allergic or toxic reaction occurring during streptomycin therapy, so that it can be treated correctly.

Dr. Stewart is Assistant Medical Director, Burge Tuberculosis Clinic, Inc., St. Luke's and Children's Medical Center.

1. Price, C. W.; Randall, W. A.; Chandler, V. L., and Reedy, R. J.: Observations on the Vivo and in Vitro Development of Bacterial Resistance to Streptomycin, J. Bact. **53**: 486-487, 1947.

The Agglutination Test in Tularemia.—The agglutination test is standard and usually sufficient, a test of amazing reliability. It is never positive during the first week of the disease. It usually becomes positive sometime during the second week, with the titer rising abruptly later in that week or at the beginning of the third week, rising usually to a level of 1:640 or 1:1280. Once a patient has acquired serum agglutinins as a result of tularemic infection, they persist for the length of life of the patient. This situation is quite unlike that of bacillary dysentery or of typhoid or paratyphoid fevers. The agglutinin titers in tularemia do not disappear after recovery is complete. This means, of course, that a person with symptoms that suggest tularemia of six days' duration but who was found on that day to have an agglutination titer of 1:320 has an existing infection that is clearly not tularemia.—Lee Foshay, Diagnosis and Treatment of Tularemia, *Postgraduate Medicine*, October 1948.

Council on Foods and Nutrition

This paper was prepared at the request of the Council and is one of a series appearing in THE JOURNAL. *Later the entire series will appear in book form as the Council's Handbook of Nutrition.* JAMES R. WILSON, M.D., *Secretary.*

ADEQUACY OF AMERICAN DIETS

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For a long time food has been front page news. In many countries of the world the chief concern has been enough food. Calories have assumed new importance in scientific, economic and political fields. It is only in countries like the United States with abundant food supplies that chief attention can be focused not on "how much food" but on "how good" are the diets of the people.

An ideal report on the adequacy of American diets would be based on periodic and detailed studies of food

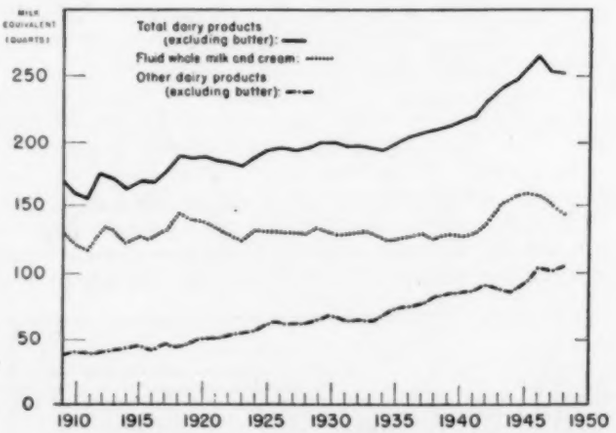

Chart 1.—Dairy Products, excluding butter: per capita consumption in the United States, 1909-1948. (Estimates of the Bureau of Agricultural Economics, United States Department of Agriculture.)

consumption in a cross section of the various population groups and on parallel investigations of the nutritional status of the people consuming this food. Such data are not available at present; hence information of many kinds must be put together to give an indication of the situation. This chapter deals chiefly with food supplies and the factors affecting their distribution among various groups and with the importance of, and some of the opportunities for, improving dietary levels in the United States.

TRENDS IN FOOD CONSUMPTION IN THE UNITED STATES

Trends in the consumption of some major groups of foods are shown in the accompanying charts.[1] One of the most decided changes and one of great importance for improved nutrition is the increased use of milk. Reenforcing the upward trend since 1909 in the consumption of milk products such as cheese, ice cream and evaporated and dried milk, the use of fluid milk rose sharply during the early war years (chart 1). In terms of total milk equivalent, consumption of milk

1. Consumption data prepared by the Bureau of Agricultural Economics, United States Department of Agriculture.

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and its products other than butter averaged nearly 3 cups per day per person in 1945—as compared with less than 2 cups in 1909. As a result there was an increase of 40 per cent in the calcium content of the per capita food supply and a considerable increase in riboflavin.

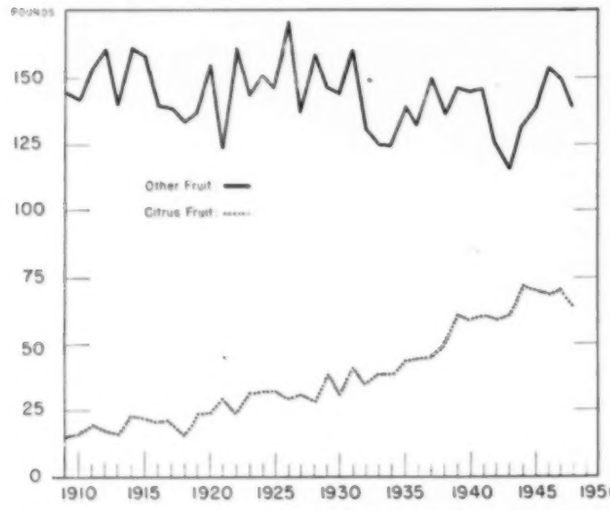

Chart 2.—Fruit: per capita consumption in the United States, 1909-1948. (Estimates of the Bureau of Agricultural Economics, United States Department of Agriculture.)

Consumption of citrus fruit (chart 2) and of leafy, green and yellow vegetables (chart 3) also has shown an upward trend during these years. More than four times as much citrus fruit was consumed in 1945 as in 1909. Yearly per capita consumption of meat, poultry and fish averaged 165 pounds (75 Kg.) or more (retail weight) in the period 1944 to 1947, compared with

Chart 3.—Vegetables: per capita consumption in the United States, 1909-1948. (Estimates of the Bureau of Agricultural Economics, United States Department of Agriculture.)

137 pounds (62 Kg.) in the prewar years, 1935-1939 (chart 4).

While we have been eating more of some foods we have eaten less of others. Consumption of grain products and potatoes has declined considerably since 1909, although the downward trend was arrested during the war years, when supplies of fat and sugar were somewhat restricted.

The net effect of these shifts in consumption is shown in estimates of the nutritive value of the per capita food supply. Trends over a thirty-nine year period are shown in chart 5 in available supplies of calcium, iron and of five vitamins for which the National Research Council has suggested daily allowances. At the close of the war the calculated quantities of most nutrients were higher than at any time during the thirty-nine year period. For calcium the increase has been continuous. The similarity in the trends of calcium and riboflavin up to 1943 reflects the fact that milk is the most outstanding single food source of both; it has contributed from two thirds to three fourths of the calcium and nearly half the riboflavin in the national diet. After 1943 riboflavin increased more sharply than calcium because of its use in the enrichment of flour and bread.

For several nutrients the most striking increase has come since 1940. Higher levels of vitamin A (as carotene) as well as of ascorbic acid can be associated with the increased consumption of vegetables and fruits.

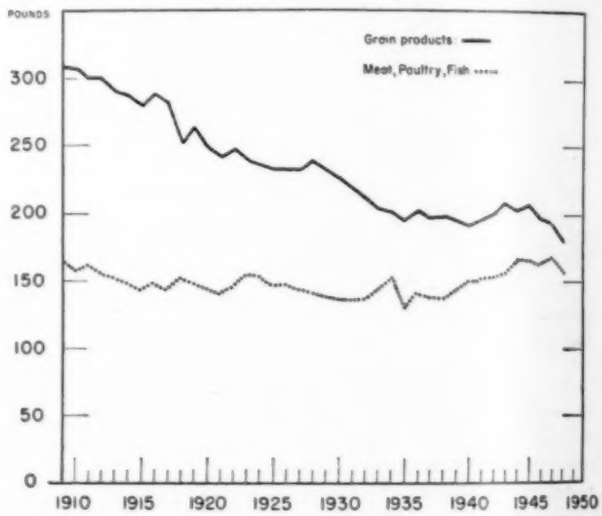

Chart 4.—Meat, poultry, fish; grain products: per capita consumption in the United States, 1909-1948. (Estimates of the Bureau of Agricultural Economics, United States Department of Agriculture.)

The greatest increases were in thiamine, niacin, riboflavin and iron, which were higher by a third to a half than the prewar levels. About half of these increases were the result of the enrichment of flour and bread. The great similarity in the trend lines for these three nutrients is associated with their occurrence in foods. Two groups—grain products and meat, poultry and fish—furnish about half the iron and thiamine and about two thirds of the niacin in the per capita food supply.

The peak years in average nutrient levels were 1945 and 1946, with 1948 somewhat lower. Compared with those of most countries of the world, these levels were exceedingly liberal, and they indicate a decided improvement over prewar levels in the United States, as shown in table 1. In 1935-1939 the national food supply did not furnish enough calcium to provide for every person in the country the quantities recommended by the National Research Council even if it could have been equitably distributed. Also, margins for the B vitamins were small compared with recommended amounts.

As they are now made, estimates of the nutrient content of the national food supply tend to be high. The large excess of calories over estimated needs indi-

cates something of the waste factor inherent in these figures. Food waste often is especially large in institutions and public eating places, but may also be considerable in households in upper income groups.

For other nutrients apparent margins of supply over need should be generous, for foods and nutrients are

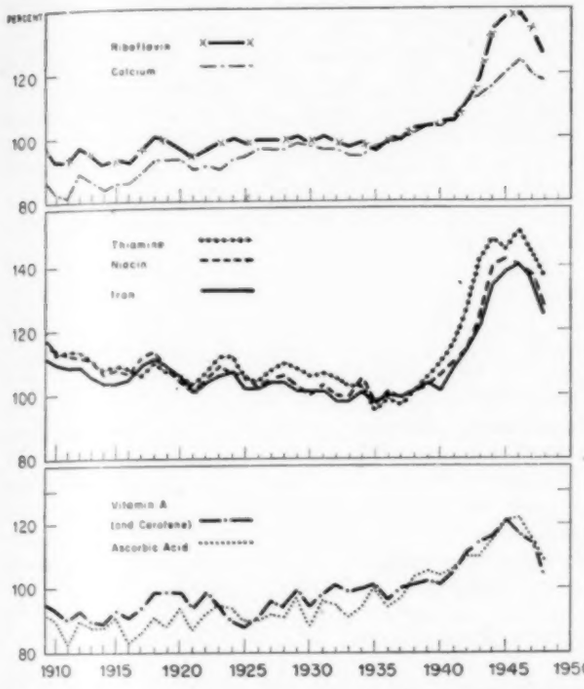

Chart 5.—Calcium, iron and vitamins in the United States per capita food supply, 1909-1948 (index numbers: 1935-1939 = 100). (Computed by the Bureau of Human Nutrition and Home Economics, United States Department of Agriculture.)

seldom distributed in accordance with need among the persons in a family or among the families of a nation. Large numbers of persons probably get less than optimal quantities of one or more nutrients. Others have diets providing much larger quantities of some nutrients than the allowances suggest. If these latter groups continue to enjoy their liberal diets and if all those who consume less than recommended quantities were brought up to those levels, nutrient averages for the country as a whole would be much higher than they were in 1945 and 1946.

These facts should be kept in mind in any comparison of the nutrients in the per capita food supply with recommended dietary allowances. Other factors to be considered are those involved in any comparison of the calculated nutrient content of a diet with recommended allowances. For example, most tables of food composition suitable for use with foods "as purchased" make no allowance for losses that occur in home storage or in preparation for eating. For ascorbic acid and some of the B vitamins which are water soluble, heat labile and readily oxidized, these losses may be very high. On the other hand, recommended dietary allowances represent quantities to be ingested. They are considered high enough "to cover substantially all individual variations in the requirements of normal persons." However, much more needs to be known about variations in requirement, about the utilization of nutrients in the body and the possibility of synthesis of certain vitamins in the intestinal tract before a close evaluation of dietary adequacy can be made on the basis of dietary calculations and recommended allowances.

INEQUITABLE DISTRIBUTION

Spot studies provide evidence that even in the peak years of supply, 1945-1946, many families did not have nutritionally good diets. In the summer of 1945 the Bureau of Human Nutrition and Home Economics obtained data regarding diets of families living in the open country in one county in Georgia and in one in Ohio. In the Georgia county, the food of one third of the white farm families and of two thirds of the Negro families provided less than two thirds of the dietary allowances recommended by the National Research Council, for one or more nutrients. The prevalence of such unsatisfactory diets was twice as high among sharecroppers and farm laborers as among owners and renters; it was somewhat higher among large than small families in the same income class.

Among Negro families in the Georgia county, vitamin A was the nutrient that most often seemed to be comparatively low in the diet. More than half of the families had food that provided less than two thirds of the recommended amounts. A greater consumption of green or yellow vegetables, of whole milk, butter or vitamin A fortified margarine would have increased the vitamin A value of diets. About a fourth of the families had food that furnished less than two thirds of the recommended levels of calcium and ascorbic acid, and the diets of nearly a fifth were correspondingly low in riboflavin. More milk and more vitamin C-rich fruits and vegetables would have improved the diets with respect to these nutrients also.

TABLE 1.—*Calculated Nutritive Value of U. S. Civilian per Capita Food Supply, Prewar, 1945 and 1948, Compared with Recommended Dietary Allowances (1948) of the National Research Council's Food and Nutrition Board*

Nutrient	Nutritive Value per Capita per Day*			Per Capita Allowances Based on Recommendations of the National Research Council†
	1935-1939	1945	1948	
Food energy.....cal.	3,250	3,370	3,330	2,600
Protein.....Gm.	89	103	96	65
Calcium.....Gm.	0.90	1.08	1.06	1.06
Iron.....mg.	13.8	19.0	17.5	11.6
Vitamin A value ‡.....I.U.	8,100	9,800	8,700	4,560
Thiamine, total.....mg.	1.54	2.24	2.09	1.24
Thiamine per 1,000 calories.....mg.	0.47	0.66	0.63	0.48
Riboflavin.....mg.	1.86	2.55	2.38	1.63
Niacin.....mg.	15.4	21.9	19.9	12.4
Ascorbic acid.....mg.	115	139	127	70

* Computed by the Bureau of Human Nutrition and Home Economics on basis of estimates prepared by the Bureau of Agricultural Economics of apparent civilian consumption (retail basis) including foods supplied by farm and city gardens. No deductions have been made for waste of food in the home or for losses of nutrients in food preparation. No allowance has been made for nutrients added to the food supply through the use of baking powder, yeast, mold inhibitors, the added minerals in self-rising flour or for nutrients added in the processing of certain foods, such as vitamins used as antioxidants and calcium salts used in some canned foods.

† Recommended dietary allowances suggested for 17 sex-age-activity groups (National Research Council Reprint and Circular Series no. 129, Revised 1948) were weighted by the number of persons in each group according to 1948 population estimates.

‡ Vitamin A values expressed as international units, include carotene sources. Carotene was converted on the basis that 0.6 microgram of beta-carotene or 1.2 micrograms of other vitamin A-active carotenoids is equivalent to one I.U. of vitamin A. Current research suggests that many of the vitamin A values ascribed to carotene-rich foods in the literature need to be revised, and as they stand probably are too high to indicate physiologic utilization. Hence, the calculations in this table may considerably overestimate the margin above recommended allowances.

It is true in general that farm families are relatively well fed because they can and do raise so much of their own food supply. However, there are wide differences

in the suitability of individual farms for producing different kinds of food. Farm tenure makes a difference, also. Farm owners and renters are more likely to have extensive programs of food production for household use than are sharecroppers and tenants.

In the Ohio county, where income levels were somewhat higher and a greater proportion of the farm families were owners, family diets were somewhat better than in the Georgia county.

TABLE 2.—*Consumption in a Week by Families of Husband and Wife and 1 or 2 Children Under 16, in New England, Middle Atlantic and North Central Villages, 1935-1936* *

Income Class (Dollars)	Families, No.	Milk Equivalent,† Qt.	Eggs, Doz.	Meat, Poultry, Fish, Lb.	Fats,‡ Lb.	Flour Equivalent,§ Lb.	Dry Beans and Peas, Lb.	Potatoes, Sweet Potatoes, Lb.	Fresh Vegetables, Lb.	Fresh Fruit, Lb.
0-499.....	9	10.7	1.3	4.9	2.7	10.3	0.9	16.2	4.1	6.4
500-999....	108	10.2	1.5	6.4	2.9	10.0	0.5	12.6	4.5	6.4
1,000-1,499	171	12.3	1.7	8.0	3.0	10.0	0.4	12.5	5.8	8.2
1,500-1,999	83	13.4	1.7	9.6	3.0	9.9	0.3	11.9	7.6	11.0
2,000-2,999	51	15.8	1.9	9.9	3.1	11.0	0.2	11.0	7.9	12.6
3,000-4,999	12	15.7	1.5	10.9	3.3	9.3	0.6	12.5	8.6	12.2

* Stiebeling, H. K.; Monroe, D.; Phipard, E. F.; Adelson, S. F., and Clark, F.: Family Food Consumption and Dietary Levels, Five Regions, Miscellaneous Publication 452, United States Department of Agriculture, 1941.

† Approximately the quantity of fluid milk to which the various dairy products (except butter) are equivalent in minerals and protein.

‡ Includes butter, bacon and salt pork.

§ Two thirds of the weight of baked goods has been added to that of flour, meals and cereals.

Money for Food.—Too little money for food is still a major cause of poor diets. In the Georgia county studied four fifths of the open country families had net money incomes of less than $1,000 in 1944-1945; in the Ohio county two fifths of the families had incomes under $1,000. Although in the country as a whole per capita incomes were more than twice as high in 1948 as in 1940, food prices also about doubled in that period. Food costs affect everyone, whereas not all families have shared equally in income advances. Consequently, large numbers cannot afford to buy the kinds and quantities of foods needed for good diets.

Food for 4 persons in quantities and types included in the city worker's family budget developed by the Bureau of Labor Statistics would have cost about $20 a week in June 1947 in the 34 cities in which the budget was priced. This budget represents a modest but fairly adequate standard of living. The kinds and quantities of food included are typical of those purchased by American families whose diets provide approximately the dietary allowances recommended by the Food and Nutrition Board of the National Research Council.

The trend in food prices is shown by the following figures. To follow a low cost food plan prepared by the Bureau of Human Nutrition and Home Economics, a family of 4 might have spent at average city prices:

June 1936.....	$ 9.00-$10.00
June 1942.....	10.00- 11.00
June 1945.....	13.00- 14.00
June 1948.....	18.00- 20.00

In 1948 it would have taken about 50 per cent of a $2,000 family income to provide this diet and 35 per cent in 1945. Figures are not available to show how many 4 person families earned $2,000 or less in 1948. In 1945 it was estimated that about one fourth of the 4 person families in the United States had incomes under $2,000. Food costs for larger families are proportionately higher, of course. Of the total number of families of 5 or more persons, 30 per cent had incomes under $2,000 in 1945.

Even for small families food costs are frequently a problem. A fifth of the 2 person families had incomes under $1,000 in 1945. Expenditures for this low cost adequate diet would have amounted to $10 or $11 a week in June 1947, or about 55 per cent of the weekly share of an income of $1,000 for the year.

Even with the income increases that took place in 1947 and 1948, it is likely that thousands of families are spending a relatively large share of the family income for food at the expense of other needs and that unless they spend this money for food in a nutrition-wise fashion, and so handle and prepare the food as to conserve food values to the utmost, diets are deteriorating accordingly.

The relation of income to food consumption has been shown by many dietary studies. This relationship is most clearly shown by data from a fairly homogeneous sample—that is, from families of similar composition living in the same kind of community in the same region. Some of the most recent dietary studies were made during the war years when food rationing influenced normal consumption patterns and obscured somewhat the full effects of income. Hence the data selected to show the relation of income to diet in table 2 are from a nationwide study in 1935-1936; they show weekly consumption of selected foods by families of husband and wife, and 1 or 2 children under 16, living in villages of the New England, Middle Atlantic and North Central regions.

In successively higher income classes these families used larger quantities of milk, meat, fresh vegetables and fresh fruit. Consumption of eggs and fats increased slightly and that of grain products (in terms of flour equivalent) changed little, while quantities of dried peas and beans and of potatoes declined.

Family Size.—The kind of diet a family can have depends not only on family income but on the number of persons that income must support. Within a given income class, total expenditures for food increase with increasing family size, but food expenditures per person decrease. The figures in table 3 show food expenditures in September-October 1944 of city families with incomes for the year between $2,000 and $3,000 [2]:

TABLE 3.—*Food Expenditures of City Families with Annual Incomes of $2,000 to $3,000 (September-October 1944)*

Number of Persons in Family	Average Food Expense in 1 Week	
	Per Family	Per Person
1.....	$ 9.76	$ 9.76
2.....	14.42	7.21
3.....	16.53	5.51
4.....	18.58	4.64
5.....	20.55	4.11
6 or more.....	24.51	4.08 or less

While there may be some economy in buying food in larger quantity, it is relatively small compared with the added cost of feeding more persons. The result is that diets of large families tend to contain smaller quantities of protective foods and, therefore, are less likely to be adequate nutritionally than diets of small families at the same income level.

Additional data on the relation of family size to the character of the diet are given below. These figures show the estimated expenditures in October 1947 for

2. Wartime Food Purchases, Bulletin 838, United States Department of Labor, 1945.

meat, poultry, fats and eggs by families of different size living in Cumberland, Md.[3]

It is apparent that the larger the household size the smaller was the average expenditure per person for meat, poultry, eggs and fats. The average amounts spent in households of 2 persons would have been almost enough to purchase the quantities of these foods

TABLE 4.—*Relation of Family Size to Diet (October 1947, Cumberland, Md.)*

Household Size	Average Expenditure per Person per Week for Meat, Poultry, Eggs, Fats	Percentage of Families Whose Expenditures per Person for Meat, Poultry, Eggs and Fats Were in Excess of $2.00	$2.50	$3.00
2 or less	$3.20	64	55	46
3	2.59	70	35	25
4	2.38	53	42	28
5	1.84	38	17	17
6	1.39	11	11	..
7 or more	1.32	13	4	..

suggested in the moderate cost food plan of the Bureau of Human Nutrition and Home Economics. At October 1947 prices an expenditure of from $3.30 to $3.60 per person would have been needed to buy these quantities for a household of a moderately active man and woman. However, fewer than half the 2 person families in Cumberland were spending more than $3 per person; a third were spending less than $2, for which they scarcely could have purchased the quantities of these foods in the low cost food plan.

In the 4 person household average expenditures per capita were close to the estimates of the cost ($2.50 to $2.70) of meat, poultry, eggs and fats in the moderate cost plan for 2 moderately active adults, a boy 13 to 15 and a child 7 to 9 years of age. Only 40 per cent of the 4 person Cumberland families were spending this amount or more.

In the 7 person households, average expenditures for meats, eggs and fats were only $1.32 per person per week. This is less than the amount needed in October 1947 ($1.45 to $1.60) to buy these foods in the low cost diet of the Bureau of Human Nutrition and Home Economics for a family of 2 adults, 2 teen-age and 3 younger children.

Differences between the low cost and the moderate cost food plans [4] are illustrated by the weekly quantities of foods suggested for the family of 4 previously described (table 5).

Season.—Few studies have been made to show seasonal differences in the nutritive content of family diets. There is evidence that considerable variation may be found, in part associated with seasonal availability of food supplies. For example, consumption of sweet potatoes in the South is highest in the months following their harvest and decreases in late winter as stored supplies diminish. This seasonal change in consumption influences the vitamin A value of diets. In towns and cities, abundant market supplies of fresh citrus fruit at reasonable prices may tend favorably to influence the ascorbic acid content of diets during late winter and spring.

Some seasonal variations may be the result of changes in the foods themselves. In general, vitamin values of foods tend to decrease during prolonged storage. Potatoes stored six months may have lost two thirds of the ascorbic acid present at harvest. Because they are eaten in fairly large quantities, potatoes constitute an important potential source of ascorbic acid. However, their contribution toward the end of their season may be much less than at the beginning. Farm families dependent for vitamin C on home-grown and stored potatoes, cabbage, apples and canned tomatoes and other vegetables may be running low in this nutrient along toward spring. Studies of ascorbic acid levels in plasma of school children in rural areas have shown this to be the case.

Availability.—It is usually taken for granted in the United States that if people have enough money they can buy the foods needed for a good diet. Yet this is not always true. In some sections of this country the local supply of milk has been inadequate for school feeding programs. Other examples could be cited to show how differences in availability of food supplies from one place to another may affect food consumption and the nutritional quality of the diet.

Food Habits.—Poor diets are often the result of poor food habits even when there is enough money for food. At almost any level of expenditure above a certain minimum, some families manage to have nutritionally good diets while others do not. For example, the figures below show the proportion of families with different kinds of diets obtained for about the same amount of money. These were village and city families in the North and West with food expenditures in 1936 between $2.77 and $3.45 per food expenditure unit per week. The proportions are as follows:

Good diet	24%
Fair diet	64%
Poor diet	12%

Reports of poor food habits have been numerous in the last two or three years. Sometimes conclusions are based on the number of servings of different types of food in a day or a week as compared with some arbitrary meal pattern. In other studies conclusions relate to calculations of the nutritive value of the food consumed during a given period.

TABLE 5.—*Suggested Foods for Family of Four* *

	Low Cost Plan	Moderate Cost Plan
Leafy, green and yellow vegetables	9 lb. 4 oz.	13 lb. 4 oz.
Citrus fruit, tomatoes	9 lb. 0 oz.	11 lb. 0 oz.
Potatoes, sweet potatoes	13 lb. 8 oz.	11 lb. 0 oz.
Other vegetables, fruit	7 lb. 8 oz.	13 lb. 8 oz.
Milk (or its equivalent)†	22 qt.	23½ qt.
Meat, poultry, fish	7 lb. 8 oz.	10 lb. 8 oz.
Eggs	20 (eggs)	28 (eggs)
Dry beans and peas, nuts	1 lb. 6 oz.	12 oz.
Flour, cereals‡	14 lb. 4 oz.	12 lb. 4 oz.
Fats and oils§	3 lb. 4 oz.	3 lb. 10 oz.
Sugar, sirups, preserves	3 lb. 4 oz.	3 lb. 14 oz.

* Two adults, a boy 13 to 15 years and a child 7 to 9 years.
† In cheese, cream, ice cream.
‡ Count 1½ pounds (680 Gm.) of bread or baked goods as 1 pound (454 Gm.) of flour.
§ Includes butter, bacon, salt pork.

A recent analysis of some 25,000 one day food records throws light on current food habits in four areas studied by the United States Public Health Service under their Nutritional Appraisal and Demonstration Program. These food records were obtained from persons, a large proportion of whom were children, being examined for physical evidence of nutritional deficiency. In one area

3. Bureau of Human Nutrition and Home Economics: Unpublished data.

4. Based on September 1948 food plans. The following publications on food plans may be obtained from the Bureau of Human Nutrition and Home Economics, United States Department of Agriculture: AIS-21, "Food for Two"; AIS-59, "Food for the Family with Young Children"; AIS-71, "Food for the Family with School Children," and Miscellaneous Publication 662, "Helping Families Plan Food Budgets."

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59 per cent of the subjects reported no green or yellow vegetables during the day of the record; in one area 61 per cent reported no milk or less than 1 cup, and in one area about three fourths had no vitamin C-rich food, such as citrus fruit, tomatoes or raw green cabbage. The types of foods which seemed least likely to be missing during a day were enriched grain products and such foods as meats or eggs.

These data were considered indicative of food habits which, if continued over a long period, may result in measurable evidence of nutritional deficiencies. Clinical observations among the persons studied bore this out. Signs and symptoms suggestive of mild deficiencies were common, although severe malnutrition was rarely found. For example, in one county [5] in Florida in which over 6,000 school children were examined, hemoglobin levels below 12.0 Gm. per hundred cubic centimeters were found in 37 per cent of the white boys under 13 years of age and 35 per cent of the white girls. Among Negro children under 13 years, the percentages were 65 and 63, respectively. Also, there was a relatively high incidence of follicular conjunctivitis, cutaneous folliculosis and gingivitis. The authors did not undertake to interpret these observations in terms of deficiencies of specific nutrients. It seems questionable, however, that they represent high levels of nutritional health.

Sometimes diets are recognized as inadequate only when it is shown that higher levels of intake result in superior health or physiologic performance. For example, the effects of modern feeding regimens on the growth and development of infants indicate that former practices did not provide fully for their nutritional requirements. Perhaps even more striking is the evidence now accumulating of the favorable influence of superior maternal diet on maternal health, on the course of pregnancy and delivery and on the condition of the infant. Observations like these give a glimpse into the concept of optimal nutrition.

TOWARD IMPROVED NUTRITION

There is considerable evidence that a large share of the population is not attaining a level of nutritional health which the science of nutrition has shown to be a potentiality, although diets in general were better in the middle 1940's than in any previous period. Further improvement must be along the lines of better distribution of foods or nutrients among the underconsuming segments of the population.

Improvement of Foods.—One way of improving diets without changing food consumption habits is through the nutritional improvement of foods themselves. In some instances this may be done through actual addition of certain nutrients. Examples include the addition of vitamin D to milk (or its development in milk), the addition of iodine to salt, vitamin A to margarine and the restoration of some of the nutrients lost in the milling of cereal products.

Enrichment of flour and bread with iron, thiamine, riboflavin and niacin was endorsed by the Food and Nutrition Board of the National Research Council and by the Council on Foods of the American Medical Association as a means of safeguarding health and well-being, especially during the war period. It began on a voluntary basis in 1941, but by the end of the second year about three fourths of all family flour and bakers' white bread was enriched. Under War Food Order No. 1, enrichment of bakers' white bread was made mandatory from January 1943 to October 1946. As of November 1948, twenty-three states and two territories, Puerto Rico and Hawaii, had enacted legislation requiring enrichment of both bread and white flour sold within their boundaries. In the remaining states, voluntary enrichment is being continued extensively, according to recent surveys made by the industry.

Because bread and flour are consumed in relatively large quantities and by almost everyone, enrichment of these foods had a measurable effect on the nutritive value of the average diet, as pointed out earlier. According to calculated values, the per capita food supply in 1945 provided 17 per cent more iron, 27 per cent more thiamine, 12 per cent more riboflavin and 19 per cent more niacin than it would have without enrichment of these foods. In individual diets, benefits were proportional to the consumption of bread and flour. Presumably they would be greater among the low than the high income groups.

Enrichment of degerminated cornmeal and grits was a logical sequence to the flour and bread program, since these foods are used so extensively in certain areas of the country. Several of the Southern states have passed laws requiring enrichment of these products at levels promulgated by the Federal Food and Drug Administration.

Another practical field of endeavor and one economical of our resources is the fuller conservation of nutrients originally present in foods. The milling of grains to retain a high proportion of their original food value is an example of what might be accomplished. Research has shown that delays in marketing and improper or prolonged storage, as well as processing methods, take their toll of some of the vitamins. Further losses in nutrients occur in the kitchen. Some of these are needlessly large because of poor food preparation practices, the holding or reheating of cooked products and the waste of edible food. In addition, the nutritive content of foods may be increased to some extent through improved animal feeding and breeding, plant breeding and better cultural practices.

School Lunches.—Among the fruitful efforts to raise nutritional levels are those concerned with the improved feeding of children. One good school meal a day can do much toward improving the well-being of children whose home diets are not providing adequately for food needs. Numerous observations on the attendance, behavior and progress of children receiving school lunches would seem to bear this out. As a result school lunch programs have been widely endorsed in the United States as in other countries, by health officers, nutritionists and others concerned with promoting higher levels of nutritional health.

Several studies have been planned to measure objectively the nutritional benefits to children participating in school lunch programs. One of these,[6] carried on over a five year period among rural children in Florida, provides evidence that the school lunch offers an effective means of raising the nutritional status of school children. The authors, however, stress the importance of adequate supervision and special planning to take care of known deficiencies. Lack of these controls may explain in part why some studies have not shown such clearcut results.

5. Anderson, R. K., and Sandstead, H. R.: Nutritional Appraisal and Demonstration Program of the U. S. Public Health Service, J. Am. Dietet. A. **23**: 101-107 (Feb.) 1947.

6. Abbott, O. D.; Townsend, R. O.; French, R. B., and Almann, C. F.: Effectiveness of the School Lunch in Improving the Nutritional Status of School Children, Bulletin 426, University of Florida, Agricultural Experiment Station, 1946.

Perhaps almost as important as the food itself is the educational experience provided by the school lunch. Eating well planned, well cooked meals day after day cannot fail to be influential in establishing good food habits. This experience will be most effective if accompanied with an integrated program of nutrition education throughout the curriculum.

The present federal school lunch program operates under the National School Lunch Act, which was passed in 1946. In the school year ending June 1948, nearly 45,000 schools participated in the indemnity plan, which means that sponsors were reimbursed by the government for part of the local purchases of food, provided that the meals served met certain specifications. In the peak months more than 6,000,000 children had a school lunch, with the peaks maintained longer than in 1947. Indications are that as the states work out better provisions for administering the program it will expand and go forward on a more stable and permanent basis.

In addition to the federal assistance given by reimbursement in the indemnity plan, the Department of Agriculture makes available for use in the lunch program special purchases of certain foods. These foods provide an important nutritional contribution to the meals served. Purchases for the year 1947-1948 included such foods as nonfat dry milk, cheese, dried eggs, dried fruits, peanut butter, sweet potatoes and concentrated orange juice.

The school lunch program provides one means for more equitable distribution of national food supplies in accordance with need. If expanded to include all children in school it would go far to safeguard the nutritional health of this group. Less attention has been given in the United States to meeting the special food needs of expectant and nursing mothers, infants and preschool children. In some countries these groups are given high priority in the distribution of available foods.

Home-Produced Food.—Food raised for family consumption not only spares cash for other needs but improves the family diet as well. The kinds of foods that are home produced on many farms—milk, eggs, meats, vegetables and fruit—are good sources of the nutrients likely to be low in diets of many families. Even the city backyard garden is worth while; families who raise their own vegetables tend to eat more. At the same time they are taking advantage of freshly harvested products, thereby avoiding the nutrient losses often incurred in usual marketing procedures. For many families more extensive or better planned home production offers the most feasible way of improving diets.

Education.—The importance of education as a factor in raising nutritional levels cannot be overemphasized. Every one needs to know how to select an adequate diet. The lower the income the more difficult it becomes and the more important it is that the food dollar be spent to best advantage. However, many persons who can afford good diets do not know enough about food selection.

Knowledge of nutritional requirements and how they may be met by foods, while far from complete, has advanced far enough to offer sound guidance in our teaching. But the application of the knowledge we have has lagged behind its development. Nutrition education in a broad sense includes convincing people that what they eat makes a difference. Experience has shown that motivation is the most difficult hurdle to surmount in trying to change food habits. It is essential that the physician, nurse, nutritionist, teacher and other key persons in the community have a strong personal conviction of the importance of the right food for the growth and development of children and for optimal health and well-being at all ages. For this they also need scientific information about food values in relation to cost, in order to understand the practical aspects of feeding problems. While an able job in nutrition education is being done on many fronts, more widespread and more adequate education in all aspects of the nutrition problem is needed by every one from health officers and other physicians down to the food manager for the family and the individual consumer. Determining the ultimate success in the broad practice of nutrition and holding the key to the adequacy of American diets is the housewife who spends the family food money, who prepares the family's three meals a day and who guides the food habits of children in their formative years. The physician as one of the influential members of society must give his support to this aspect of training for homemaking.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

AUSTIN SMITH, M.D., *Secretary.*

ESTROGENIC SUBSTANCES (WATER INSOLUBLE) (See New and Nonofficial Remedies 1947, p. 343).
The following dosage forms have been accepted:

COLE CHEMICAL CO., ST. LOUIS 8

Aqueous Suspension Estrogenic Substances: 20,000 I. U. per cc., 10 cc. vials. Preserved with chlorobutanol 0.5 per cent.

Solution Estrogenic Substances in Oil: 2,000 and 5,000 I. U. per cc. in peanut oil, 1 cc. ampuls; 10,000 I. U. per cc. in peanut oil, 1 cc. ampuls and 10 cc. vials.

REED & CARNRICK, JERSEY CITY, N. J.

Aqueous Suspension Estrogenic Substances: 20,000 I. U. per cc., 5 cc. and 10 cc. vials. Preserved with chlorobutanol 0.50 per cent.

KREMERS-URBAN CO., MILWAUKEE 12

Aqueous Suspension Estrugenone with Benzyl Alcohol 2%: 250,000 I. U. per cc., 5 cc. vials; 20,000 I. U. per cc., 1 cc. ampuls and 5 cc. vials.

U. S. Patent 377,549.

PROTEIN HYDROLYSATE (See THE JOURNAL, March 6, 1948, p. 693).
The following additional dosage form has been accepted:

INTERCHEMICAL CORPORATION, BIOCHEMICAL DIVISION, UNION, N. J.

Solution Elamine (modified casein hydrolysate) 10% with Dextrose 5%: 600 cc. bottles. An acid hydrolysate of casein from which glutamic and aspartic acids have been partially removed and to which tryptophane has been added. It is virtually salt-free. No preservative is added.

U. S. Patent pending.

FOLIC ACID (See THE JOURNAL, May 22, 1948, p. 367).
The following dosage form has been accepted:

WALKER VITAMIN PRODUCTS, INC., MT. VERNON, N. Y.

Tablets Folic Acid: 5 mg. and 10 mg.

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SATURDAY, FEBRUARY 26, 1949

DIAGNOSIS OF CANCER

A recent article in the *Scientific American* contains deprecatory remarks on the histologic diagnosis of tumors and other statements which are contrary to current medical opinion.[1] Supporting scientific data are not supplied. The lessening of confidence in the value of biopsy and microscopic study which may result from the article needs to be condemned. Microscopic examination for diagnosis of tumor is not infallible. The methods need to be constantly improved, and additional supplementary diagnostic methods should be sought. Nevertheless such examination is today still one of the most useful diagnostic procedures, and in many instances the most exact practical method of diagnosis.

The article under discussion deals with the heterotransplantation of tissue as a test for cancer. In performing this test small pieces of tissue are implanted into the anterior chamber of the eye of an alien species of animal—generally the guinea pig or rabbit. If the cells are cancerous they survive and grow; if they are normal, precancerous or from a benign tumor they fail to grow. In addition to cancerous tissue only normal embryonic tissue gives a positive reaction. The author advocates this biologic test—namely, successful heterologous transplantation—as a reliable test for cancer. He states, "A pathologist who examines tumor tissue under the microscope may observe significant details of form and structure, but he can never determine its malignancy from the appearance alone." This statement is contrary to the experience of physicians who know that cancer can usually be so recognized. Any pathologist who cannot diagnose tissue sections with a high degree of accuracy is unworthy of his specialty. His competence in this work is established by examination prior to certification by the American Board of Pathology. Greene does not offer evidence in support of his surprising statement, and a search of the literature does not reveal such data in his past publications.

The article further states, "Of two tumors with cells that look exactly alike, one may remain static or even disappear while the other inexorably spreads and kills the patient." If the author is here speaking of tumors which were diagnosed as benign by microscopic criteria, he is correct only with respect to the extremely rare examples of "benign metastasizing tumors"; he is wrong as far as the ordinary experience is concerned. If he is referring to tumors which are diagnosed as cancer on section, he is almost equally in error because spontaneous regression of such tumors is exceedingly rare. The well trained, experienced pathologist makes few mistakes in distinguishing tumors which will have a benign behavior from those which will run a malignant course, and such tumors rarely, if ever, "look exactly alike" to the experienced observer.

The article also attributes to the "biological view" a "fundamentally new concept of cancer," namely, that it ". . . is not the result of a sudden transformation, but is the final product of a developmental process." This concept is not new. It may be found in many old papers and books on tumors. A recent textbook[2] devotes much space to this idea. Many tumors may gradually or suddenly increase in degree of malignancy. Such tumors include, among others, mixed tumors of the salivary glands, neurofibroma, giant cell tumor of bone, laryngeal papilloma, pigmented nevus, bronchial adenoma and adenomatous polyp of the stomach and colon.

The statement is made that ". . . patients with disorders diagnosed as cancer by morphologist not infrequently make a complete recovery, whereas a diagnosis of cancer based on the behavior of the tissue is invariably followed, in spite of all attempts at treatment, by the death of the patient." Few, if any, patients on whom a diagnosis of cancer has been made by a competent pathologist make a complete recovery without treatment. Formerly, before such treatment was available, persons with tumors of similar morphology invariably died, as they still do today if they fail to have proper treatment. These results establish the cancerous nature of such tumors beyond question. Some forms of cancer which formerly had a mortality of about 100 per cent now show a high rate of cure (e. g., mammary cancer, carcinoma of the larynx, etc.). If the heterotransplantation technic is positive only in cases which are invariably fatal, then it is failing to detect many cancers. Perhaps the method is finding only the most highly malignant cases. The author concedes that there are different degrees of malignancy. To reject as malignant all tumors which fail to grow after heterotransplantation is unjustifiable on the basis of information now available.

1. Greene, H. S. N.: On the Development of Cancer, Scient. Am. **179**: 40, (Dec.) 1948.

2. Willis, R. A.: Pathology of Tumors, St. Louis, C. V. Mosby Co., 1948.

An example of superiority of microscopic examination over heterologous transplants in diagnosing cancer is well illustrated by the first case cited by the author: A tumor on two occasions failed to grow after inoculation into guinea pig eyes and takes as proof of malignancy by this technic were obtained only on the third attempt (with the second tumor recurrence). The microscopic diagnosis of fibrosarcoma, in contrast, was already made on the first surgical specimen. This diagnosis was correct, as was subsequently shown by rapid recurrences of the tumor after surgical removal on two occasions and eventually by the development of metastases.

The transplantation technic is slow and expensive, and it fails to distinguish between nonneoplastic lesions and benign tumors—information which is often desirable from the specimen. The justification for risking the lessening of public confidence in the established diagnostic method of microscopic examination is questioned.[3]

ARE MEDICAL CARE PRICES EXCESSIVE?

Elsewhere in this issue is a comparison of the final 1948 Consumers' Price Index with the preliminary index of medical care prices of the United States Bureau of Labor Statistics. The entire cost of living index was 171.2 for 1948; the Bureau of Medical Economic Research of the American Medical Association estimates that the index of medical care prices, a small part of this cost of living index, will be only 141 for 1948. The base period 1935-1939 equals 100. This spread of 30 points compares with a spread of 27.6 points in 1947—159.2 and 131.6.

Again it appears certain that the prices charged by the physicians, dentists and hospitals for rooms have not risen as fast as the cost of living. These figures were developed by an agency of the federal government. These data clearly show that the cost of living in 1948 was much higher than the level of prices which the American people were paying for the various medical care items sampled by the field representatives of the United States Bureau of Labor Statistics.

The index for hospital room rates will probably be 212 for 1948 as compared with 179.6 in 1947. This high index of 212 is included in the general medical care index of 141; if it were not included, the latter would be much below 141. Actually the hospital is a buying and selling institution. Since it buys goods and services and sells them soon after purchase in the form of services to patients, the hospital cannot escape contemporary inflation.

These estimates should set at rest a good many wild and irresponsible statements about the exorbitantly high prices being paid for medical care. The statements are simply untrue if we are to be guided by the well known cost of living index of the United States Department of Labor. Physicians generally may not realize that this cost of living index is widely used in the United States as a basic formula for wage adjustment.

A SECRETARY OF HEALTH, EDUCATION AND WELFARE

Recently the Committee on Expenditures of the House of Representatives held hearings on the creation of a cabinet post for health, education and welfare. First to appear was Mr. Oscar Ewing, who spoke in favor of such a cabinet position. Newspapers generally report that Mr. Ewing is himself a candidate for this cabinet office. The American Medical Association was represented at the hearings by Dr. John W. Green of California. Dr. Green emphasized the record of the American Medical Association since 1884, urging the creation of a separate department of health under a cabinet officer. Repeatedly representatives of the American Medical Association have petitioned Congress and various presidents of the United States urging such consolidation of health activities. Dr. Green pointed out that an examination of the various proposals to group health activities of the federal government under one head indicates that this may be accomplished in a number of ways. The most commonly considered conceptions are:

1. A separate Department of Health whose head has cabinet status.
2. Combining all health activities of the federal government in a separate agency not of cabinet status.
3. Combining health activities with other activities of the federal government in one department.

He then indicated still further the reasons why the medical profession feels that there should be a single Department of Health rather than an agency with three divisions:

> The American Medical Association is strengthened in its position that there should be a single Department of Health by the reports recently submitted by the Hoover Commission. It is apparent that one of the nation's greatest interests is in the health of its citizens, and health is of such a nature that, to be most effective, it must be individualized. The Association has recently issued a program emphasing the importance of this point of view.
>
> There is some difference of opinion as to whether the Secretary should have the qualifications of a practicing physician or whether his duties could not be discharged as well if he were not a medical practitioner. We cannot accept the statement which has been made that a physician competent to manage such a department or bureau cannot be found. To us it seems that the first function of such a department should be to guarantee the public that it will have available adequate medical care. This involves decision and perspective in the medical and public health fields which only a trained practicing physician can possess. Good administration is vital, and the Secretary should have as his aide an Under Secretary who is a thoroughly trained administrator.

3. Foord, A. G., in discussion on Greene, H. S. N.: Identification of Malignant Tumors, J. A. M. A. **137**: 1364 (Aug. 14) 1948.

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Current Comment

OUR GREATEST CHILD HEALTH PROBLEM

A statistical summary [1] of some of the important causes of death at school age, 1945-1946, gives the lie to recent irresponsible statements concerning the health conditions of our children. A recent release from what should certainly be considered an unimpeachable source (National Office of Vital Statistics) again clearly shows that the greatest problem is continuously and increasingly one of accident prevention. "In a total of 32,960 deaths from all causes in 1946 among persons 5 to 19 years old, 12, 342 or 37 per cent of all deaths were caused by accidents as compared to 35 per cent in 1945 and 34 per cent in 1941, the last prewar year." Deaths from accidents among children 5 to 9 years of age were three times as numerous as the combined number of deaths from poliomyelitis and pneumonia, the greatest nonaccidental killers and perhaps the most feared of childhood diseases. In the 10 to 14 age group accidents outranked diseases of the heart, the single greatest nonaccidental cause of death, 3,153 to 656, or nearly 5 to 1. Even among young persons 15 to 19 years of age, when tuberculosis is the greatest cause of fatality with heart disease and pneumonia next in line, accidents accounted for nearly twice as many deaths as the three together. In an analysis of mortality figures A. D. Battey, senior statistician for the National Safety Council, summarizes in an accompanying article as follows:

> Among school children 5 to 14 years old, preventive medicine has proved its effective power. In 1930, 19 out of 100,000 of these children died of pneumonia and influenza; in 1946, only 5 out of 100,000 died of these diseases. In 1930, 12 out of 100,000 died of tuberculosis; in 1946, fewer than 4. In 1930, 13 out of 100,000 died of appendicitis, and 12 of heart disease; in 1946, only 2 out of 100,000 died of appendicitis and 5 of heart disease.
>
> In 1930, 36 out of 100,000 children 5 to 14 years old died of accidents; in 1946, 29, an improvement of only 19 per cent. This relatively small decrease indicates the need for more effective work in the field of accident prevention.

Our present major problems in reduction of mortality for these age levels are: (*a*) improved programs of accident prevention; (*b*) bettered public health programs and facilities for the prevention, diagnosis and treatment of tuberculosis; (*c*) research into the causes and control of the greatest killers such as heart disease, cancer and poliomyelitis, and (*d*) education of the public to early use of available facilities for care of these conditions. Obviously these programs of safety, public health, research and education must be widely implemented before further progress can be achieved through medical care. Significantly enough, the medical profession, through its national state and local associations and societies, for years has been doing everything possible to effectuate these programs. Here are established needs, well defined areas in preventive medicine in which government—national, state, and local—has broad responsibilities and in which complete cooperation by the medical profession is assured.

1. Battey, A. D.: Let's Look at the Record, Safety Educ. **28**:7 (Dec.) 1948.

SALT SUBSTITUTES—A WARNING

The American Medical Association and the Food and Drug Administration have issued warnings concerning the use of preparations that have been sold as salt substitutes. These warnings were based on reports of several deaths which, it is claimed, followed the use of preparations containing lithium chloride. Certain therapeutic measures require the restriction of sodium chloride in the diet, which patients who prefer food flavored with salt do not relish. To provide flavoring, some manufacturers have made available salt substitutes, at least several brands of which contained lithium chloride, which now is known to possess harmful possibilities. The products containing lithium that have been available are reported to include food-sal,® salti salt® and west-sal.® The early symptoms of lithium poisoning are similar to the symptoms of heart and kidney diseases which require a salt-free diet, and include drowsiness, weakness, loss of appetite, nausea, tremors and blurring of vision. It has been suggested that patients who have been using lithium-containing preparations for prolonged periods may be given solution of sodium chloride if their medical problems will permit the temporary use of this substance, but there is doubt in some centers that sodium chloride affects lithium excretion. An intensive program by the Food and Drug Administration and the manufacturers is now under way to recall all lithium-containing salt substitutes from the market. Details concerning the deaths and other untoward effects that have been reported will appear in early issues of THE JOURNAL. In the meantime, the Council on Pharmacy and Chemistry also is initiating an investigation to gain additional facts. No lithium-containing salt substitute is advertised in the publications of the American Medical Association.

THE DAN GILBERT LETTER

Not long ago the National Physicians Committee circulated to the medical profession a letter by one Dan Gilbert, who was early in his career at the age of 26 years associated briefly in Washington with the notorious Gerald Winrod. Later Gilbert resigned from any connection with Winrod, and, when John Rogge was associated with the Department of Justice in Washington, Gilbert was chief witness against Winrod in a case brought by the government. The circulation of the letter by Gilbert to Protestant ministers and to the medical profession has been bitterly condemned by many hundreds of physicians who have written to the office of the American Medical Association in Chicago and who have in some places held protest meetings on the subject. THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION authorizes the statement that the Gilbert letter was sent without the knowledge of any official of the American Medical Association, that every official of the American Medical Association joins in condemning the letter as an expression of medical opinion in this country and that the American Medical Association does not require allies of doubtful repute in its campaign for the maintenance of a high quality of medical care and for freedom in medicine in our country.

ORGANIZATION SECTION

THE PHYSICIAN'S FEDERAL INCOME TAX

Prepared by the Bureau of Legal Medicine and Legislation, American Medical Association

Federal income taxpayers on a calendar year basis must on or before March 15 do two things: (1) They must file their final returns for the year 1948 and (2) they must file a declaration of estimated tax for 1949.

REVENUE ACT OF 1948

This act effected numerous changes in existing law that will in many instances result in a saving to taxpayers. One of the most important changes relates to the splitting of income, for tax purposes, between husband and wife and the filing of joint returns. If either the husband or wife has a surtax income in excess of $2,000, and if a joint return is filed, the family will realize a saving, since the splitting of the income will make applicable lower surtax rates.

A new exemption in the amount of $600 was created for taxpayers 65 years old or over. The ordinary personal exemption was increased from $500 to $600, as was also the exemption for the blind. A physician and his wife, both 65 years or older, who file a joint return may therefore claim four exemptions of $600 each and additional exemptions of like amount for dependents and in case either spouse is blind. The income tax returns have been much simplified during recent years and contain most of the basic information that a physician needs who prepares his own return or has it prepared by an office assistant, to complete the return. Additionally the Treasury Department last fall released a sixteen page booklet of instructions to aid taxpayers in completing Form 1040A, Short Form 1040 and Long Form 1040, one of which most physicians will find suitable to their needs. A copy of this booklet was forwarded to each prior taxpayer. Persons who will make returns or file estimates for the first time this year can undoubtedly obtain a copy of the booklet from the local office of the Collector of Internal Revenue.

Since this basic information has thus been made generally and readily available, it would serve no helpful purpose to repeat it here. The concluding portion of this statement, therefore, will discuss aspects of the law and its requirements that are of particular concern to physicians.

GROSS INCOME

Gross Income.—A physician's gross income is the total amount of money received by him during the year for professional services, regardless of the time when the services were rendered for which the money was paid, assuming that the return is on a cash receipts and disbursements basis, plus such money as he has received from investments and from other sources.

If a physician receives a salary as compensation for services rendered and in addition thereto living quarters or meals, the value to the physician of the quarters and meals so furnished ordinarily constitutes income subject to tax. If, however, living quarters or meals are furnished for the convenience of the employer, the value thereof need not be computed and added to the compensation otherwise received by the physician. As a general rule, the test of "convenience of the employer" is satisfied if living quarters or meals are furnished to a physician who is required to accept such quarters and meals in order to perform properly his duties. For example, if a physician employed by a hospital is subject to immediate service at any time during the twenty-four hours of the day and therefore cannot obtain quarters or meals elsewhere without material interference with his duties and on that account is required by the hospital to accept the quarters or meals furnished by it, the value thereof need not be included in the gross income of the physician.

Tuition payments and subsistence allowances for veterans made under the G. I. Bill of Rights are not taxable income. Mustering out payments are likewise nontaxable.

DEDUCTIONS FOR PROFESSIONAL EXPENSES

A physician is entitled to deduct all current expenses necessary in carrying on his practice. The taxpayer should make no claim for the deduction of expenses unless he is prepared to prove the expenditure by competent evidence. As far as practicable, accurate itemized records should be kept of expenses and substantiating evidence should be carefully preserved. The following statement shows what such deductible expenses are and how they are to be computed:

Office Rent.—Office rent is deductible. If a physician rents an office for professional purposes alone, the entire rent may be deducted. If he rents a building or apartment for use as a residence as well as for office purposes, he may deduct a part of the rental fairly proportionate to the amount of space used for professional purposes. If the physician occasionally sees a patient in such dwelling house or apartment, he may not, however, deduct any part of the rent of such house or apartment as professional expense; to entitle him to such a deduction he must have an office there, with regular office hours. If a physician owns the building in which his office is located, he cannot charge himself with "rent" and deduct the amount so charged.

Office Maintenance.—Expenditures for office maintenance, as for heating, lighting, telephone service and the services of attendants, are deductible.

Supplies.—Payments for supplies for professional use are deductible. Supplies may be fairly described as articles consumed in the using; for instance, dressings, clinical thermometers, drugs and chemicals. Professional journals may be classified as supplies and the subscription price deducted. Amounts currently expended for books, furniture and professional instruments and equipment, "the useful life of which is short," generally less than one year, may be deducted, but if such articles have a more or less permanent value, their purchase price is a capital expenditure and is not deductible.

Equipment.—Equipment comprises property of a more or less permanent nature. It may ultimately wear out, deteriorate or become obsolete, but it is not in the ordinary sense of the word "consumed in the using."

The cost of equipment such as has been described, for professional use, cannot be deducted as expense in the year acquired. Examples of this class of property are automobiles, office furniture, medical, surgical and laboratory equipment of more or less permanent nature, and instruments and appliances constituting a part of the physician's professional outfit, to be used over a considerable period of time, generally over one year. Books of more or less permanent nature are regarded as equipment, and the purchase price is therefore not deductible.

Although the cost of such equipment is not deductible in the year acquired, nevertheless it may be recovered through depreciation deductions taken year by year over its useful life, as described later.

No hard and fast rule can be laid down as to what part of the cost of equipment is deductible each year as depreciation. The amount depends to some extent on the nature of the property and on the extent and character of its use. The length of its useful life should be the primary consideration. The most that can be done is to suggest certain average or normal rates of depreciation for each of several classes of articles and to leave to the taxpayer the modification of the suggested rates as

the circumstances of his particular case may dictate. As fair, normal or average rates of depreciation, the following have been suggested: automobiles, 25 per cent a year; ordinary medical libraries, x-ray equipment, physical therapy equipment, electrical sterilizers, surgical instruments and diagnostic apparatus, 10 per cent a year; office furniture, 5 per cent a year.

The principle governing the determination of all rates of depreciation is that the total amount claimed by the taxpayer as depreciation during the life of the article, plus the salvage value of the article at the end of its useful life, shall not be greater than its purchase price. The physician must in good faith use his best judgment and claim only such allowance for depreciation as the facts justify. The estimate of useful life, on which the rate of depreciation is based, should be carefully considered in each individual case.

Dues.—Dues paid to societies of a strictly professional nature are deductible. Dues paid to social organizations, even though their membership is limited to physicians, are generally held to constitute personal expenses and as such are not deductible. If, however, membership in social organizations, such as a country club, is maintained both for personal and professional or business purposes and if evidence can be produced to substantiate the claim that a part of the expenses of such membership was incurred for business purposes, then it would seem that these latter expenses would be deductible. Further discussion of this particular aspect of the federal law will be found in a subsequent paragraph dealing with the deductibility of entertainment expenses.

Postgraduate Study.—The Commissioner of Internal Revenue holds that the expense of postgraduate study is not deductible.

Traveling Expenses.—Traveling expenses, including amounts paid for transportation, meals and lodging, necessarily incurred in professional visits to patients and in attending medical meetings for a professional purpose, are deductible.

Entertainment Expenses.—The deductibility of entertainment expenses, when incurred for business purposes, has been upheld, as applied to an actor, in the case of *Blakmer v. Commissioner*, 70 F. (2d) 255. In the case of *Jacobson*, 6 T.C. 1048, the taxpayer was allowed a deduction of expenses incurred for entertaining clients and employees of his law firm. The deductibility for such expenses by an attorney came before the U. S. Tax Court in the cases of *Clyde A. Armstrong* and *Ethlyn L. Armstrong v. Commissioner* and *Clyde A. Armstrong v. Commissioner*, which were decided on Aug. 29, 1947. In a memorandum opinion rendered by Judge Opper, this was said:

Taxpayer, a Pittsburgh attorney, became a member of the University Club and the Duquesne Club in order to have available facilities for the entertainment of his clients; his purpose in joining the clubs was not particularly to make contacts productive of new business. In 1942, 1943 and 1944 the Commissioner disallowed deductions representing club dues, but allowed 50 per cent of the house bills incurred by taxpayer at each of the clubs during those years. The court finds that taxpayer used the club facilities not less than 50 per cent of the time for entertaining clients and other purposes incident to the practice of his profession, and allows the deduction of dues to that extent.

In the December 1948 issue of the *Medical Annals of the District of Columbia*, page 697, there was published correspondence that had passed between the Secretary of the Medical Society of the District of Columbia and the Internal Revenue Agent in the Baltimore Division, Treasury Department, in which the latter stated that if entertainment expenses incurred by a physician have a direct relation to the production of income, and can be supported by the taxpayer, they will be taken into consideration in determining his net taxable income.

Automobiles.—Payment for an automobile is a payment for permanent equipment and is not deductible. The cost of operation and repair, and loss through depreciation, are deductible. The cost of operation and repair includes the cost of gasoline, oil, tires, insurance, repairs, garage rental (when the garage is not owned by the physician), chauffeur's wages and the like.

Deductible loss through depreciation of an automobile is the actual diminution in value resulting from obsolescence and use and from accidental injury against which the physician is not insured. If depreciation is computed on the basis of the average loss during a series of years, the series must extend over the entire estimated life of the car, not merely over the period in which the car is possessed by the present taxpayer.

If an automobile is used for professional and also for personal purposes—as when used by the physician partly for recreation, or so used by his family—only so much of the expense as arises out of the use for professional purposes may be deducted. A physician doing an exclusive office practice and using his car merely to go to and from his office cannot deduct depreciation or operating expenses; he is regarded as using his car for his personal convenience and not as a means of gaining a livelihood. What has been said in respect to automobiles applies with equal force to horses and vehicles and the equipment incident to their use.

MISCELLANEOUS

Contributions to Charitable Organizations.—For detailed information with respect to the deductibility of charitable contributions generally, physicians should consult the official return blank or obtain information from the collectors of internal revenue or from other reliable sources. An individual taxpayer can deduct such contributions only to the extent that they do not exceed 15 per cent of his adjusted gross income. The physician may not deduct as a charitable contribution the value of services rendered an organization operated for charitable purposes.

Bad Debts.—Physicians who make their returns on a cash receipts and disbursements basis, as most physicians do, cannot claim deductions for bad debts.

Taxes.—Taxes generally, either federal or state, are deductible by the person on whom they are imposed by law. Both real and personal property taxes are deductible; but so-called taxes, more properly assessments, paid for local benefits, such as street, sidewalk and other like improvements, imposed because of and measured by some benefit inuring directly to the property against which the assessment is levied, do not constitute an allowable deduction from gross income. Physicians may deduct state gasoline taxes and state sales taxes. In some states sales taxes are imposed on the seller, but if they are passed on to the buyer the latter may deduct them.

State income and use taxes are deductible; federal income taxes are not. Federal import, excise or stamp taxes are deductible only to the extent that they are attributable to business activities. State automobile license fees are deductible. If a state or local fee is imposed for regulatory purposes, and not to raise revenue, the fee may not ordinarily be deducted as a tax. If such fees, however, are classifiable as a business expense they are deductible as such. Annual registration fees imposed on physicians probably come within the category of regulatory fees and should be deducted as a business expense rather than as taxes. Local and state occupational taxes imposed on physicians are deductible either as taxes or as a business expense, depending on the purpose for which the tax is imposed.

The excise taxes imposed on employers by section 804, title VIII, and section 901, title IX, of the Social Security Act, commonly referred to as old age and unemployment benefit taxes, are deductible annually by employers in computing net income for federal income tax purposes. If the taxpayer's return is made on a cash basis, as are the returns of practically all physicians, the taxes are deductible for the year in which they are actually paid. If the return is made on an accrual basis, the taxes are deductible for the year in which they accrue, irrespective of when they are actually paid. Employees, including physicians whose employment brings them within that category, may not deduct the tax imposed on them by section 801, title VIII, of the Social Security Act, generally referred to as the old age benefits tax. If, however, the employer assumes payment of the employee's tax and does not withhold the amount of the tax from the employee's wages, the amount of the tax so assumed may be deducted by the employer, not as a tax paid but as an ordinary business expense.

Medical Expense.—A taxpayer may deduct amounts expended for medical, dental and hospital expense for himself, his spouse or a dependent, not compensated for by insurance or otherwise, including amounts paid for health and accident insurance, according to a prescribed formula. The law limits the deduction to a maximum of (*a*) $1,250 if the taxpayer claims only one exemp-

tion; (*b*) $2,500 if the taxpayer is a single person or if married and filing a separate return and claims more than one exemption; (*c*) $2,500 if the taxpayers are married and file a joint return and claim two exemptions, $3,750 if three exemptions are claimed and $5,000 if four or more exemptions are claimed.

Laboratory Expenses.—The deductibility of the expenses of establishing and maintaining laboratories is determined by the same principles that determine the deductibility of corresponding professional expenses. Laboratory rental and the expenses of laboratory equipment and supplies and of laboratory assistants are deductible when under corresponding circumstances they would be deductible if they related to a physician's office.

Losses by Fire or Other Causes.—Loss of and damage to a physician's equipment by fire, theft or other cause, not compensated by insurance or otherwise recoverable, may be computed as a business expense and is deductible, provided evidence of such loss or damage can be produced. Such loss or damage is deductible, however, only to the extent to which it has not been made good by repair and the cost of repair claimed as a deduction.

Insurance Premiums.—Premiums paid for insurance against professional losses are deductible. This includes insurance against damages for alleged malpractice, against liability for injuries by a physician's automobile while in use for professional purposes, and against loss from theft of professional equipment and damage to or loss of professional equipment by fire or otherwise. Under professional equipment is to be included any automobile belonging to the physician and used for strictly professional purposes.

Expense in Defending Malpractice Suits.—Expense incurred in the defense of a suit for malpractice is deductible as a business expense.

Sale of Spectacles.—Oculists who furnish spectacles, etc., may charge as income money received from such sales and deduct as an expense the cost of the article sold.

Medical Economics

MEDICAL CARE PRICES vs. COST OF LIVING

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The final report of the United States Bureau of Labor Statistics places their Consumers' Price Index for 1948 at 171.2. The Bureau of Medical Economic Research has estimated that the index of medical care items, a small part of the total index, will stand at 141 for 1948. The base period 1935-1939 equals 100. If our preliminary estimates are later confirmed by the Bureau of Labor Statistics, 1948 will be another year in which the cost of living has been higher than the level of prices paid for medical care items. The final and official index of medical care items for 1948 will probably be 141 plus or minus 1.

The estimates for medical care items, a component part of the total index of prices paid by moderate income families in thirty-four large cities, are the means of the four quarterly indexes published by the United States Department of Labor. The cost of living index is used widely in the United States for the adjustment of wages although it is developed by a sampling process and covers only moderate income families in thirty-four large cities. In the accompanying table the final cost of living index and our estimates of the medical care indexes for 1948 are presented along with the final figures for 1947. No decimals are shown for our 1948 estimates, as these figures are preliminary. In 1947 the Consumers' Price Index was 159.2 and the medical care portion thereof was 131.6, a spread of 27.6. Apparently the spread in 1948 kept pace with the 1947 difference.

There are fifteen medical care items which are grouped into eight categories. Our estimate of the 1948 index for medical care excluding drugs is 145 or 4 points above the index of 141 for medical care including drugs. For drugs alone our estimate for 1948 is 122. In the five indexes under medical care excluding drugs, physicians' services (general practitioners only) is estimated at 136 for 1948. (Office visit at 138, house visit at 129 and obstetrical case at 154.) The 1948 index for surgeons and specialists combined is 136 (appendectomy at 133 and tonsillectomy at 139) and for dental care combined 146. The 1948 index for optical services combined is estimated at 124.

The most significant change is in the fifth category, hospital rates combined, which soared from 179.6 in 1947 to 212 in 1948. The index of 212 for hospitals is included in the index of 141 for all medical care and drugs combined; if it had not been included the latter would have been considerably below 141. Prices for laboratory and other services rendered by hospitals are not sampled; hence the hospital index covers primarily room rates. The hospital is uniquely exposed to the forces of inflation. It is a buying and selling institution with large current costs and few fixed charges. It buys goods and services and sells services soon after purchase. Its costs are not stabilized by such customary accounting items as depreciation and taxes because most hospitals are public institutions. Hence the changes in the current prices of food and fuel and in hourly wage rates are potent in changing hospital room rates charged to patients because there are no other costs of importance. The sharp increase in the index of hospital room rates for 1948 over 1947 reflects to some extent the failure of hospitals to raise their rates earlier. The recent decline in the prices of farm products has not yet materially reduced the operating costs of hospitals.

Indexes of Component Medical Care Prices and the Consumers' Price Index, 1947, 1948
1935-1939 = 100 *

	1947	1948
Consumers' price index (cost of living)	**159.2**	**171.2 (preliminary)**
Medical care and drugs, combined	**131.6**	**141**
A. Medical care, excluding drugs	135.3	145
1. Physicians' services, combined (general practitioners only)	130.3	136
a. Office visit	131.5	138
b. House visit	125.3	129
c. Obstetrical case	143.7	154
2. Surgeons and specialists, combined	129.4	136
a. Appendectomy, adult, surgeon	128.2	133
b. Tonsillectomy, child, hospital, specialist	130.7	139
3. Dental care, combined	137.4	146
4. Eyeglasses, complete	118.6	124
5. Hospital rates, combined	179.6	212
B. Prescriptions and drugs, combined	115.4	122
1. Prescriptions, combined	123.7	134
Physicians, combined (general practitioner, surgeon, specialist)	130.2	136

* The Consumers' Price Index for 1948 was obtained by letter from the United States Bureau of Labor Statistics; presumably this figure will be published in the February 1949 issue of the Monthly Labor Review of the United States Department of Labor. The indexes for medical care prices appeared in the following mimeographed publications of the United States Bureau of Labor Statistics: Indexes of Retail Prices of Services and Miscellaneous Goods, United States Bureau of Labor Statistics, LS 48-1093, March 1935 to June 1947, pp. 6-3, 7-3 and 8-2; Indexes of Retail Prices of Apparel, Housefurnishings, and Services and Miscellaneous Goods to Moderate Income Families in Large Cities of the United States, United States Bureau of Labor Statistics, LS 49-62, Supplement II issued August 1948, p. 3, and LS 49-1783, Supplement III issued November 1948, p. 4.

The accompanying table should be considered an extension of table 7 on page 14 of Bulletin 66, "The Cost and Quantity of Medical Care in the United States." A copy of this bulletin will be sent on written request to the Bureau of Medical Economic Research, American Medical Association, 535 North Dearborn Street, Chicago 10.

The Bureau of Medical Economic Research would like again to commend the physicians in the thirty-four large cities and their county medical societies for the time taken to provide field representatives of the United States Department of Labor with the requested information on fee schedules, the dentists who have provided their information, the hospitals and the oculists and the druggists. One cannot stress too strongly the value of this cooperation to the Bureau of Medical Economic Research. It needs this information for many research projects and hopes that physicians will continue to cooperate with the field representatives and statisticians of the United States Department of Labor.

Official Notes

ALUMNI AND FRATERNITY REGISTRATION AT A. M. A. CONVENTION

All medical school alumni organizations and medical fraternities which desire space at the Atlantic City Session of the American Medical Association for registration are requested to communicate with Dr. Walton Van Winkle Jr., American Medical Association, 535 North Dearborn Street, Chicago 10, Illinois, and provide the following information: (1) name of organization; (2) name of person or persons who will be in charge of registration, and (3) if tickets are to be sold, (*a*) date and time of function, (*b*) location and (*c*) price.

The following regulations have been established regarding registration of alumni organizations and medical fraternities: 1. Only those organizations which have made application as outlined will be provided registration space. Space will be assigned on the basis of the order in which applications are received. 2. No sign, placard or other display larger than 24 inches by 24 inches will be permitted. 3. An organization must supply its own cash boxes, tickets, placards and one or more persons to handle ticket sales and registration. 4. Organizations will be permitted to register jointly but such arrangements must be made by agreement between the affected organizations and notice of such arrangements is to be sent to Dr. Van Winkle at American Medical Association headquarters. 5. The American Medical Association can assume no responsibility for tickets sold or money collected by alumni or fraternity organizations at the convention.

RESOLUTION OF MILK PRODUCERS FEDERATION ON RURAL HEALTH

The National Cooperative Milk Producers Federation at their recent annual meeting in Portland, Ore., asked the following resolutions concerning the rural health program of the American Medical Association:

"General health and welfare of rural people can be well served by a constructive program of education and service such as that now being conducted by the American Medical Association through its committee on rural medical service. This program is making real progress. Through it the federation and other farm groups have been able to take part in offering counsel and advice toward extending an ever improving health program to more rural people."

Medical Legislation

STATE LEGISLATION

California

Bills Introduced.—A. Constitutional Amendment 61 proposes the creation of a California **State Board of General Practitioners Examiners**, a certificate from which would authorize the holder to use drugs or what are known as medical preparations in or upon human beings and to sever tissue in the practice of minor surgery and to use any and all other methods in the treatment of diseases, injuries, deformities, or other physical or mental conditions, except major surgery. Major surgery is defined as the penetration by severing of the tissues of the body, the cranial, thoracic and abdominal cavities of the body and the severing from the body of any appendages. A. 953 proposes the creation within the department of professional and vocational standards of a board of registration for scientific medical research funds to register and to prescribe rules of conduct for persons desiring to engage in **the collection of funds for scientific medical research.** The Red Cross and the Community Chest would be exempt from the provisions of this proposal. A. 1010, to amend the Business and Professions Code, proposes that **any person** who is **licensed to practice medicine** and surgery in any other state, who is a graduate of a medical school approved by the Board of Medical Examiners, and who has applied for a physician's and surgeon's certificate in California, may be appointed to a medical staff of the Department of Corrections and may treat persons under the jurisdiction of that department for one year. At the end of that year, the applicant must have secured a physician's and surgeon's certificate in order to continue as a member of the staff. Until such person has secured his physician's and surgeon's certificate he shall not engage in the practice of medicine in the state except as provided in this proposal. A. 1072 proposes the enactment of **an alcoholics rehabilitation law** under the direction of the department of mental hygiene assisted by an advisory board, two members of which shall be physicians designated by the California Medical Association. A. 1074, to amend the law relating to **premarital tests,** proposes that the word "physician" as used in the premarital examination law shall include chiropractors. A. 1213 proposes the creation of a **Board of Physiotherapy Examiners** and defines physiotherapy as the performing for compensation of any professional service requiring special education, knowledge or skill by persons who undertake or represent themselves as able to treat or to alleviate ailment, deformity, fatigue, disease, injury, pain or any other physical condition by various modalities; electricity, electronics (except x-ray, radium), light, heat, water, corrective exercise and therapeutic massage. Nothing in this proposal would be construed to provide that the person representing himself as a physiotherapist is allowed to diagnose or to prescribe internal treatment. A. 1215, to amend the Business and Professions Code, proposes that all **prescriptions given to patients to be filled** by a pharmacist shall be in writing and shall be in legible, readily understandable, English. A. 1218, to amend the Business and Professions Code, proposes that **any person who practices** or attempts to practice any system or mode of treating the sick or afflicted or to alleviate ailments, deformity, fatigue, human disease, injury, obesity, pain or any other physical or mental condition by the use of massage, therapeutic massage, exercise or therapeutic exercise or by the use of the physical, chemical and other properties of electricity, heat, light or water, except by prescription or direction of a licensed practitioner, without having a license to practice medicine, osteopathy or chiropractic, shall be deemed guilty of a misdemeanor. A. 1219, to amend the Business and Professions Code, proposes that any person violating any of the provisions of the Business and Professions Code should be prosecuted by **the particular board which issued him his license.** A. 1270 proposes that **no blind person shall be denied** admission to any examination for a chiropractic license on the ground that he is blind. A. 1301, to amend the Business and Professions Code, proposes the creation of a State **Board of Examiners of Psychologists** and proposes that a person will be deemed to be practicing psychology who renders to individual clients or to the general public, for fees or personal profit, any professional service requiring the application of recognized principles, methods and procedures of the science and profession of psychology (such as the technics of psychometrics, psychotherapy, any form of individual analysis, and hypnosis and its applications) for the purpose of psychologic diagnosis, classification, evaluation, reeducation, guidance or personal adjustment. A. 1499, to amend the health and safety code, proposes the creation of an **Advisory Chronic Disease Council** to conduct a program directed toward the reduction of deaths and disability from cancer and other chronic diseases. A. 1501, to amend the Business and Professions Code, proposes to exempt from the provisions of the medical practice act the procurement of **blood specimens by venipuncture or skin puncture** for test purposes by a duly licensed laboratory technician or technologist on specific written authorization from a duly licensed physician and surgeon. A. 1602, to amend the civil code, proposes the creation of **a lien in favor of hospitals** on all causes of action for damages accruing to an injured person therein for the reasonable charges for hospital care, treatment and maintenance necessitated by the injuries giving rise to such causes of action. S. 434, to amend the Health and Safety Code, proposes the enactment of provisions relating to the regulation of the humane use of animals for diagnosis and treatment of human and animal diseases, for research in the advancement of veterinary, dental, medical and biologic sciences, animal and human nutrition, improvement and standardization of laboratory procedures and to provide for the issuance, suspension and revocation of licenses relating to **the use of animals for medical research** by the State Department of Public Health. S. 584 proposes to authorize the State Department of Public Health to assist in the development of community blood banks for the collection and distribution of **human whole blood and blood plasma.** S. 608, to amend the Business and Professions Code, proposes that any person licensed to practice medicine and surgery in any other state and who is a graduate of a medical school approved by the Board of Medical Examiners of California may be appointed to the medical staff of any state mental hospital or state home for the mentally deficient but **must not engage in the practice of medicine in the state except** so far as the inmates of the institution are concerned until he has secured a physician's and surgeon's certificate.

Bill Enacted.—S. 72 was approved Feb. 3, 1949. It permits the **Board of Osteopathic Examiners** to issue physician's and surgeon's certificates under certain circumstances.

Georgia

Bill Introduced.—H. 600 proposes the creation of a Georgia **board of naturopathic examiners** and defines naturopathy as a health science to aid in the prevention, diagnosis and cure of human ailments, diseases and injuries. The proposal further states that the practice of naturopathy shall be construed to include the application, by means of any one or more of the psychologic, physical, mechanical, chemical or material forces or agencies of nature, and all according to the fundamental principles of anatomy, the sciences of psychology, mechanotherapy, articular manipulation, corrective and orthopedic gymnastics, neurotherapy, psychotherapy, hydrotherapy, suggestotherapy, electrotherapy, thermotherapy, phototherapy, chromotherapy, vibrotherapy, thalmotherapy, phytotherapy, biochemistry, external appliances, hygiene, first aid, sanitation, heliotherapy, mineral baths and dietetics, which dietetics shall include the use of vitamins and of foods of such biochemical tissue building products and cell salts as are found in the normal body, the use of vegetal oils and dehydrated and pulverized fruits, flowers, seeds, barks, herbs, roots and vegetables.

Idaho

Bill Introduced.—H. 220 proposes the creation of a **board of naturopathy** and defines naturopathy as a system of manipulative, mechanical, mental and natural methods of treating the human body for the purpose of maintaining it in, or of restoring it to, a state of normal health. It includes the prescription and application or use of air, electricity, heat, light and water, and of earth and natural elements and fruits thereof.

Kansas

Bill Introduced.—H. 145 proposes, among other things, that **an autopsy may** be performed upon the body of a deceased person by a physician or surgeon, when so authorized in writing by the decedent during his lifetime or by the decedent's surviving husband or wife, an adult child, a parent, or a brother or sister, and any physician or surgeon performing an autopsy so authorized shall not be liable on account thereof.

Michigan

Bill Introduced.—S. 91 proposes that under certain circumstances **all children shall be immunized** against diphtheria, whooping cough, tetanus and smallpox before they register in any kindergarten or elementary school within the state unless they can show satisfactory evidence that they have been properly immunized and are adequately protected against said diseases.

Montana

Bill Introduced.—H. 285 proposes to authorize autopsies or **postmortem examinations** on dead bodies in cases where dissection, autopsy or postmortem examination is directed or authorized by the last will and testament of the deceased and in cases where the husband, wife or next of kin charged by law with the duty of burial shall in writing authorize dissection, autopsy or postmortem examination for the purpose of ascertaining the cause of death. All dissections, autopsies or postmortem examinations involving dissection of any part of the human body shall be performed by a physician or surgeon duly licensed to practice such profession by the state board of medical examiners and on completion of any such dissection, autopsy or postmortem examination the physician or surgeon shall deliver a written report thereof together with his findings as to cause of death to the next of kin of the decedent or the representative of the decedent's estate or to other persons lawfully requesting such procedures.

New Jersey

Bill Introduced.—A. 207, to amend the disability benefits law, proposes to permit a beneficiary under the act to receive care by a legally licensed **chiropodist** who, when requested by the commission, shall certify within the scope of his practice the disability of the claimant, the probable duration thereof and the medical facts within his knowledge.

New York

Bills Introduced.—A. 786, to amend the vehicle and traffic law, proposes that applicants for a **chauffeur's license** shall present a certificate from a duly licensed physician attesting that such applicant has been examined and found physically competent to operate an omnibus. A. 1078 and S. 943, to **amend the public health law,** propose that no civil action shall be brought against a physician, officer or employee of the department of health in his personal capacity for alleged damages because of the manner in which professional services were performed, any act done or failure to perform any act while discharging his official duties, without leave of a judge of a supreme court first had and obtained. Such physician shall not be liable for damages in any action if he shall have acted in good faith with reasonable care and on probable cause. A. 1098 and S. 929 propose, among other things, to eliminate from the existing law relating to the **practice of physiotherapy** the requirement that licentiates may only administer drugs or practice medicine under the supervision of a duly licensed physician. A. 1097, to amend the workmen's compensation law, proposes to authorize employees to receive **treatment by podiatrist** licensed in the state. A. 1442, to **amend the insurance law** relating to nonprofit medical and dental indemnity and hospital service corporations, proposes that such corporations shall be open to participation of all duly licensed physicians and all duly licensed dentists without discrimination against the schools of medical and dental practice. S. 630 proposes to require every physician to report immediately to the health officer **every case of infantile paralysis** under his care. S. 911, relating to the refilling of **prescriptions for somnifacient drugs,** proposes that no prescription for a barbiturate or other hypnotic or somnifacient drug shall be refilled unless the prescription includes a statement by the prescriber that it may be refilled and specifying the minimum interval between fillings and the total number of refillings prescribed.

Oklahoma

Bills Introduced.—H. 178 proposes regulations for the incorporation and licensing of charitable and benevolent nonprofit hospital service and idemnity corporations and **nonprofit medical service and indemnity corporations.** H. 180 proposes to authorize physicians, chiropractors and osteopaths who were licensed to practice in the state of Oklahoma at the time the basic science act was passed in 1937, either on the basis of examination or reciprocity, and who are also licensed at the time this proposal is enacted to receive a certificate of ability from **the basic science board** without further examination. H. 182 proposes to authorize the various professional examining boards to make **use of the injunctive process** to restrain violations of the respective acts.

Pennsylvania

Bills Introduced.—H. 190 proposes that **no state hospital** under the direction of the department of welfare having in attendance one or more physicians or interns shall increase its staff of physicians or interns unless authorized to do so by the Department of Welfare and no such permission will be granted as long as there is in the state any such hospital having one hundred beds or more but not having at least one licensed physician or intern. H. 220 proposes to authorize the department of health to investigate the **subject of alcoholism** in respect to rehabilitation and compile and maintain reliable statistics indicating the effectiveness of any rehabilitation programs carried forward by state-aided clinics for alcoholics, state hospitals and state-aided hospitals receiving alcoholics. H. 313 proposes the creation of a **state board of chiropractic examiners** and defines chiropractic as a philosophy, science and art of things natural, a system of locating misaligned or displaced vertebrae of the human spine, the procedure preparatory to and the adjustment by hand of such misaligned or displaced vertebrae and other articulations and tissues of the human body together with the use of scientific instruments of analysis. S. 223 proposes the establishment and erection within the limits of the city of Philadelphia of an institution to be known as the **Pennsylvania State Medical School.**

Texas

Bills Introduced.—H. 69 proposes the creation of a **state board of naturopathic examiners** and defines naturopathy as that philosophy and system of the healing art embracing prevention, diagnosis and the cure and treatment of human ills, diseases, traumas, deformities, and functions by the use of the several properties of air, light, heat, cold, water, mechanics, electricity, manipulation and psychology, together with the use of such substances, largely nutritional, of plant, animal or mineral origin as are naturally found in and required by the body, excluding drugs and major surgery. Nothing in the proposal should be construed as authority to authorize a naturopathic physician to practice materia medica, major surgery or any other practice licensed by law. H. 95 proposes to provide for the competent training in health education of all prospective teachers and school administrators. S. 126 proposes the creation of a **Southwestern Medical College** of the University of Texas to be established in the city of Dallas. S. 149 proposes amendments to the food and drug act, among which would be the provision that **drugs sold at retail** and containing any quantity of amidopyrine, barbituric acid, pituitary, thyroid or their derivatives must conform with the labeling requirements of the act unless they are sold on a written prescription signed by a member of the medical, dental or veterinary profession who is licensed by law to administer such drug and the label bears the name and place of business of the seller, the serial number and date of the prescription and the name of such member of the medical, dental or veterinary profession. S. 171 proposes the creation of a Texas **board of chiropractic examiners** and defines chiropractic as the practicing or employing of objective or subjective means without the use of drugs or surgery for the purpose of ascertaining the alignment of the vertebrae of the human spine and the practice of adjusting the vertebrae by hand to correct any subluxation or misalignment thereof.

Utah

Bills Introduced.—S. 169, to amend the marriage law, proposes that **applicants for a marriage license** shall file a certificate from any licensed practitioner of the healing arts which certificate shall state the age of the applicant, that the applicant has been given an examination for syphilis and that in the opinion of the physician the applicant is not infected with syphilis or other venereal disease in a communicable stage. S. 179 proposes to make permanent a board created to investigate the **causes of alcoholism** and to provide education thereon and treatment of alcoholics.

Washington

Bills Introduced.—H. 13, to **amend the chiropractic act,** proposes, among other things, that any person who has complied with the provisions of the act may adjust by hand any articulation of the spine but shall not prescribe for or administer to any person any medicine or drugs now or hereafter included in materia medica nor practice obstetrics nor practice osteopathy or surgery. H. 77 proposes the creation of a Washington **State Naturopathic Association** to regulate the practice of naturopathy, which is defined as "the science and art of applied healing forces, emphasizing the application of prophylactic, diagnostic and therapeutic naturism; thus enabling the physician to prescribe or administer to human trauma or disease by applying any one or more of the psychological, physiological, mechanical, manual, chemical, biological or material forces or agencies in restorting a normal state of being." H. 135 proposes the creation of a **sanipractic physicians' examining board** of Washington and defines sanipractic as "the science and art of applied prophylactic and therapeutic sanitation, which enables the physician to direct, advise, prescribe or apply food, water, roots, herbs, light, heat, exercises (active and passive), manipulation, adjusting tissue, vital organs or anatomical structure by manual, mechanical or electrical instruments or appliances; or other natural agency, to assist nature restore a psychological and physiological interfunction for the purpose of maintaining a normal state of health in mind and body." H. 148 proposes that any hospital **shall be liable for damages** caused by the negligence of the hospital or any employee or agent of the hospital while acting within the scope of his employment. H. 157 proposes the creation of an **examining committee of physical therapists** and defines physical therapy as the treatment of any bodily or mental condition of any person by the use of the physical, chemical and other properties of heat, light, water, electricity, massage and therapeutic exercise which includes posture and rehabilitation procedures. The use of roentgen rays and radium for diagnostic and therapeutic purposes and the use of electricity for surgical purposes including cauterization are not authorized under the term. H. 167 proposes the creation in the Department of Health of a **division of cancer control** to make investigations concerning cancer, the incidence, the prevention and treatment thereof and the mortality therefrom, and to take such action as may be necessary to assist in a reduction in the mortality due thereto.

West Virginia

Bills Introduced.—H. 16 proposes regulations for the compulsory immunization of school children for **smallpox and diphtheria.** H. 70 and S. 44 propose the establishment and maintenance in Charleston of a **four year school of medicine** and dentistry of West Virginia University. H. 144 proposes general amendments to the medical practice act, including the creation of a **medical licensing board,** the right to make use of the injunctive process in restraining violations of the act and the biennial registration of licentiates. S. 21 proposes to direct the state health commissioner to appoint a director of **the division of alcohol studies and rehabilitation** who shall have knowledge of the problems of alcoholism, treatment and rehabilitation of persons addicted to the excessive use of alcoholic beverages and for the promotion of preventive and educational programs in cooperation with state and local educational authorities.

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Washington Letter

(From a Special Correspondent)

Feb. 21, 1949.

Detailed Report on A-Bomb Effects in Preparation

More than twenty military and civilian scientists are working on the first government-sponsored public report on the atomic bomb and its effects, according to an announcement by the Atomic Energy Commission. Civil defense indoctrination and training of armed forces personnel are two of the chief uses to which the book-sized report will be put. The volume is scheduled to be published in June.

The chapter on human damage from atomic explosion is being written by Dr. Shields Warren and Col. James P. Cooney. Both are members of the Commission's Washington staff, the former as director of the Division of Biology and Medicine and Colonel Cooney as a medical liaison officer. Assisting them is Dr. H. O. Whipple of the Los Alamos Scientific Laboratory's health division.

Another chapter will be devoted to civil defense problems that may arise from use of atomic weapons. Its author is Dr. George M. Lyon, of the Office of Civil Defense Planning and the Veterans Administration. Structural damage resulting from an air burst, basic physics of the bomb, radiologic effects in water and meteorologic problems are among other topics that will be covered in the yet untitled book.

The Atomic Energy Commission disclosed simultaneously that twenty-seven nations have now qualified to receive radioisotopes for medical and biologic research from the Oak Ridge "pile." Latest to comply with provisions are Mexico, Guatemala, Brazil, Colombia and Finland. Since September 1947, a total of 384 shipments have been made to nineteen nations. Isotopes of fourteen elements have been shipped, aggregating 7,193 millicuries.

Atomic Energy Commission Reports on Progress in Medicine and Biology

Noteworthy advances in research in medicine and biology are cited in the fifth semiannual report of the Atomic Energy Commission submitted to Congress early in February. Radioisotopes produced by the commission are being used extensively in diagnosis and, to a lesser degree, in treatment of cancer, said the detailed report, adding that induction of cancer in experimental animals through application of radioisotopes has now become commonplace.

Relative to the Atomic Casualty Commission, financed with Atomic Energy Commission funds, the report discloses that laboratories are now functioning in Hiroshima and Kure, Japan, with 41 Americans and 140 Japanese engaged. "Thus far, the investigations have shown no evidence of any alteration in the offspring of exposed individuals, nor has there been any demonstrable increased incidence of stillbirths or miscarriages," according to the report. "In view of the fact that the gene injured by radiation is a recessive characteristic, it will be many years before a final statement can be developed on this problem."

First Paraplegic Miners Hospitalized in Washington

Eight paralyzed coal miners, the first to be hospitalized in Washington under the United Mine Workers rehabilitation program, arrived in the Capital Friday, February 11, and were admitted to George Washington University Hospital. All were crippled in mining accidents. To date the United Mine Workers' Welfare and Retirement Fund has hospitalized two hundred such patients on the East and West coasts. Rehabilitation of the eight men in George Washington University Hospital will be supervised by Dr. Charles S. Wise.

Psychiatrist and Dentist Added to Medical Advisory Board

Secretary of Defense Forrestal has announced the addition of Dr. Francis J. Braceland, of Rochester, Minn., and Dr. Daniel F. Lynch, of Washington, to the Armed Forces Medical Advisory Committee. The appointments bring the membership of the newly formed committee to eleven, exclusive of the lay chairman, Charles Proctor Cooper, and the Army, Navy and Air Force medical heads, who serve ex officio.

Dr. Braceland is professor of psychiatry at the University of Minnesota Graduate School and consultant to the Mayo Clinic. He also serves the Navy and Veterans Administration in consultant capacities. Dr. Lynch, a trustee of American Dental Association, is a dental surgeon in private practice here and is a consultant to the Navy Surgeon General, Army Medical Center and St. Elizabeths Hospital, Washington.

Symposiums Planned by Research Study Sections

About one hundred educators, practitioners and others concerned with the various aspects of sanitation problems attended the first symposium of 1949 sponsored by the Division of Research Grants and Fellowships, National Institutes of Health. It was held January 26-27 in the Commerce Department auditorium, twenty-five scientific papers on recent research in milk and food sanitation being presented at the four sessions that were held. Presiding officers were V. M. Ehlers, Texas State Department of Health; Dr. W. L. Mallman, Michigan State College; Maj. Raymond J. Karpen, Army Surgeon General's Office, and Dr. F. C. Bishopp, U. S. Department of Agriculture.

Plans are being made for a symposium here in April sponsored by the antibiotics study section of the National Institutes of Health, and at least one or two others are expected to be scheduled for this spring.

Coming Medical Meetings

Alabama, Medical Association of the State of, Montgomery, April 19-21. Dr. Douglas L. Cannon, 519 Dexter Ave., Montgomery 4, Secretary.

Alaska Territorial Medical Association, Juneau, March 3-5. Dr. William P. Blanton, Box 2569, Juneau, Secretary.

American Academy of General Practice, Cincinnati, Netherlands Plaza Hotel, March 7-9. Mr. Mac F. Cahal, 231 W. 47th St., Kansas City, Mo., Executive Secretary.

American Association for Thoracic Surgery, New Orleans, March 29-31. Dr. Brian Blades, George Washington University Hospital, Washington, D. C., Secretary.

American Association of Anatomists, Philadelphia, April 13-15. Dr. Normand L. Hoerr, 2109 Adelbert Road, Cleveland 6, Secretary.

American Association of Pathologists and Bacteriologists, Boston, April 15-16. Dr. Howard T. Karsner, 2085 Adelbert Road, Cleveland, Secretary.

American Broncho-Esophagological Association, Chicago, Drake Hotel, April 18-19. Dr. Edwin N. Broyles, 1100 N. Charles St., Baltimore 1, Secretary.

American College of Allergists, Chicago, April 14-17. Dr. Fred W. Wittich, 423 LaSalle Medical Bldg., Minneapolis 2, Secretary.

American College of Physicians, New York, March 28-April 1. Dr. George Morris Piersol, 4200 Pine St., Philadelphia 4, Secretary General.

American Orthopsychiatric Association, Chicago, Stevens Hotel, April 4-6. Nina Ridenour, Ph.D., 25 W. 54th St., New York 19, Secretary.

American Otorhinologic Society for the Advancement of Plastic and Reconstructive Surgery, New York, Hotel Waldorf-Astoria, March 4 Dr. Norman N. Smith, 291 Whitney Ave., New Haven 11, Conn., Secretary.

American Physiological Society, Detroit, April 19-22. Dr. Milton O. Lee, 2101 Constitution Ave., Washington 25, D. C., Executive Secretary.

American Society for Pharmacology and Experimental Therapeutics, Detroit, April 18-22. Dr. Harvey B. Haag, Medical College of Virginia, Richmond 19, Secretary.

American Society of Biological Chemists, Detroit, April 17-22. Dr. Otto A. Bessey, 1853 W. Polk St., Chicago 12, Secretary.

American Surgical Association, St. Louis, April 20-22. Dr. Nathan Womack, University of Iowa, Iowa City, Secretary.

Arkansas Medical Society, Little Rock, April 14-16. Dr. William R. Brooksher, 602 Garrison Ave., Fort Smith, Secretary.

Chicago Medical Society Annual Clinical Conference, Chicago, Palmer House, March 1-4. Dr. H. Kenneth Scatliff, 30 N. Michigan Ave., Chicago 2, Secretary.

Dallas Southern Clinical Society, Dallas, Texas, March 14-17. Miss Thelma Webb, 1133 Medical Arts Bldg., Dallas, Executive Secretary.

Iowa State Medical Society, Des Moines, April 18-21. Dr. Allan B. Phillips, 406 Sixth Ave., Des Moines 9, Secretary.

Michigan Postgraduate Clinical Institute, Detroit, Book-Cadillac Hotel, March 23-25. Dr. L. Fernald Foster, 2020 Olds Tower, Lansing 8, Mich., Secretary.

Missouri State Medical Association, Kansas City, March 27-30. Mr. T. R. O'Brien, 634 N. Grand Blvd., St. Louis 3, Secretary.

New Orleans Graduate Medical Assembly, New Orleans, Municipal Auditorium, March 7-10. Dr. W. D. Beacham, 1430 Tulane Ave., New Orleans, Secretary.

Ohio State Medical Association, Columbus, April 19-21. Mr. Charles S. Nelson, 19 E. State St., Columbus 15, Executive Secretary.

Southern Branch, American Public Health Association, Dallas, Texas, Baker Hotel, April 14-16. Dr. George A. Denison, 600 S. Twentieth St., Birmingham, Ala., Secretary.

Southwest Allergy Forum, El Paso, Texas, Hotel Paso del Norte, April 4-5. Dr. O. E. Egbert, First National Bank Bldg., El Paso, Secretary.

Tennessee State Medical Association, Chattanooga, April 12-14. Dr. W. M. Hardy, 706 Church Street, Nashville 3, Secretary.

GOVERNMENT SERVICES

NAVY

MEDICAL RESEARCH UNIT IN CAIRO

The United States Naval Medical Research Unit 3, established in Egypt in 1946, has undertaken two broad programs of medical research: 1. Study of human parasites responsible for causing or transmitting diseases of medical importance; at present these studies are in bilharzia and the biology of flies. 2. Study of the physiology and the biochemistry of patients suffering from such diseases as typhus, typhoid, amebiasis, relapsing fever and infectious hepatitis.

The Royal Egyptian Government last June leased to the United States Government an acre of land adjacent to the Abbassia Fever Hospital for twenty-five years, on which site the existing buildings are being remodeled and new ones being erected for laboratories in the fields of bacteriology, biochemistry, entomology, parasitology, physiology and virology and dental research.

The laboratories will be staffed by American scientists and technicians, as well as by guest investigators from Egypt and other countries. The American honorary consultants will visit Cairo in a few months to meet with their Egyptian colleagues, of whom the following three were recently appointed: Sir Aly Tewfik Shousha Pasha, M.D., K.B.E., Com. O. Nil., Under Secretary of State for Medical Affairs; Hafez Afifi Pasha, M.D., G.O.O. Ismail, G.C.O.Nil., former Egyptian Ambassador to England, and Ibrahim Shawki Bey, M.D., Rector of the Fouad I University.

The American honorary consultants to Naval Research Unit 3 in Cairo are: Commander R. A. Phillips, Medical Officer in Command; Francis G. Blake, M.D., dean of the School of Medicine, Yale University, New Haven, Conn.; Lowell T. Coggeshall, M.D., dean of the Medical School, University of Chicago; Wallace O. Fenn, Ph.D., professor of physiology, School of Medicine, University of Rochester, New York, and John S. Lockwood, M.D., professor of experimental surgery, College of Physicians and Surgeons, Columbia University, New York.

PERSONAL

Lieut. Emmett P. Bryant, M.R.C., of El Dorado, Ark., has been voluntarily recalled to active duty and will be assigned to instruction as a resident in obstetrics and gynecology at the Naval Hospital, Great Lakes, Ill.

CONSULTANTS TO THE BUREAU OF MEDICINE AND SURGERY

The first joint meeting of honorary and reserve consultants was held at the Naval Medical Center, Bethesda, Md., Jan. 28-29, 1949:

First row, left to right: Frank H. Lahey, M.D., Hon. Consult., Boston; Paul A. McNally, S.J., Hon. Consult., Dean, Georgetown Medical School; Rear Admiral Joel T. Boone, M.C., U.S.N., General Medical Inspector; Rear Admiral Morton D. Willcutts, M.C., U.S.N., Medical Officer in Command, National Naval Medical Center; Rear Admiral Lamont Pugh, M.C., U.S.N., Deputy and Assistant Chief of the Bureau, who acted as chairman; Rear Admiral Arthur H. Dearing, Asistant Chief of Bureau for Personnel; Rear Admiral C. V. Rault, D.C., U.S.N., Assistant Chief of Bureau for Dentistry; Captain N. J. DeWitt, Superintendent, Navy Nurse Corps, and Meyer Weiner, M.D., Hon. Consult., Coronado, Calif.

Second row, left to right: Charles Sheard, Ph.D., Hon. Consult., Rochester, Minn.; A. C. Ivy, M.D., Reserve Consult., University of Illinois, Chicago; Edward A. Strecker, M.D., Hon. Consult., Philadelphia; Roscoe Lloyd Sensenich, M.D., Hon. Consult.; President, American Medical Association, South Bend, Ind.; Oswald S. Lowsley, M.D., Hon. Consult., New York; Clyde E. Minges, D.D.S., Hon. Consult.; President, American Dental Association, Rocky Mount, N. C.; W. Calhoun Stirling, M.D., Hon. Consult., Washington, D. C.; Lowell T. Coggeshall, M.D., Reserve Consult., Dean, Div. of Biol. Sciences, Univ. of Chicago, Chicago; Arthur M. Culler, M.D., Reserve Consult., St. Louis, and Wendell G. Scott, M.D., Reserve Consult., St. Louis.

Third row, left to right: Paul W. Greeley, M.D., Reserve Consult., Chicago; Howard K. Gray, M.D., Reserve Consult., Rochester, Minn.; Edward Leroy Bortz, M.D., Hon. Consult., Philadelphia; R. Louise McManus, Ph.D., Hon. Consult., New York; James E. Paullin, M.D., Hon. Consult., Atlanta, Ga.; Ernest Edward Irons, M.D., Hon. Consult., President-Elect, American Medical Association; Shields Warren, M.D., Reserve Consult., Boston; Joseph L. T. Appleton, D.D.S., Hon. Consult., Philadelphia; M. G. Westmoreland, M.D., Reserve Consult., Executive Secretary, College of American Pathologists, Chicago; F. J. Braceland, M.D., Reserve Consult., Rochester, Minn.; Philip E. Adams, D.M.D., President-Elect, American Dental Association; Hon. Consult., Boston; Alphonse McMahon, M.D., Reserve Consult., St. Louis; Robert P. Fischelis, Pharm. D. Sc.D., Hon. Consult., Office of Secretary, American Pharmaceutical Association; Donald Hale, M.D., Reserve Consult., Cleveland; Daniel F. Lynch, D.D.S., Reserve Consult., Washington, D. C.; Sterling Bunnell, M.D., Hon. Consult., San Francisco; Joseph Barr, M.D., Reserve Consult., Boston; Capt. L. R. Newhouser, M.C., U.S.N., Bureau of Medicine and Surgery, and Paul Titus, M.D., Reserve Consult., Pittsburgh.

Last row, left to right: Edwin N. Broyles, M.D., Reserve Consult., Baltimore; Richard B. Cattell, M.D., Hon. Consult., Boston; Sister Mary Geraldine Kulleck, Hon. Consult., St. Louis; George M. Lyon, M.D., Reserve Consult., Washington, D. C.; Sister Mary Gregory Wurst, St. Louis; Marion Sulzberger, M.D., Reserve Consult., New York; Donald Anderson, M.D., Reserve Consult., Council on Medical Education and Hospitals, American Medical Association, Chicago; Edwin J. Cohn, M.D., Hon. Consult., Harvard Medical School, Boston; Ernest L. Stebbins, M.D., Hon. Consult., Johns Hopkins University, Baltimore; Donald G. Balfour, M.D., Hon. Consult., Rochester, Minn.; Gordon Barnes, Bureau of Medicine and Surgery; Comdr. Richard H. Fletcher, M.C., U.S.N., Bureau of Medicine and Surgery, and Winchell M. Craig, M.D., Reserve Consult., Rochester, Minn.

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Medical News

(Physicians will confer a favor by sending for this department items of news of general interest: such as relate to society activities, new hospitals, education and public health. Programs should be received at least two weeks before the date of meeting.)

CONNECTICUT

Seminar on School Health Education.—Yale University and twelve state and national health and education agencies will offer a graduate seminar in school health education June 27 to August 5. The program is designed to meet the needs of elementary and secondary school teachers responsible for instructing or organizing health education programs. Dr. Charles C. Wilson, professor of education and public health at Yale, is in charge of the course. Information may be obtained from Clyde M. Hill, chairman of the Yale University Department of Education, New Haven.

Fellowship in Occupational Medicine.—Yale University, New Haven, and the New Departure Division of the General Motors Corporation in Bristol announce the joint sponsorship of a one year clinical fellowship for a graduate course in occupational medicine to be directed by the Yale Institute of Occupational Medicine and Hygiene and the New Departure Division in cooperation with the state department of health. A short period of orientation in the Connecticut Bureau of Industrial Hygiene will be included in the section on industrial hygiene and safety. Candidates must be graduates of a class A medical school and rank in the upper two thirds of their classes. At least twelve months' rotating internship, or its equivalent in hospital training, is required along with an interest in occupational medicine and hygiene, public health, health conservation and case-finding programs. A license to practice medicine and surgery in Connecticut is also required. A candidate who completes his fellowship satisfactorily will be awarded a certificate. Information may be obtained from the Institute of Occupational Medicine and Hygiene at Yale University.

ILLINOIS

Public Health Association Meeting.—The Illinois Public Health Association will hold its annual meeting at the La Salle Hotel, Chicago, April 7-8. Among the participants will be Drs. Leonard A. Scheele, Surgeon General, U. S. Public Health Service and Dr. Leroy E. Burney, state health director, Indianapolis. It is expected that the Illinois Association of Medical Health Officers will complete organization at the time of the public health association meeting. The decision to reactivate the health officers' association was made at the annual conference for the local and district health officers in Springfield last October. Dr. Winston H. Tucker, Evanston, is chairman of the committee.

County Society Lectures.—Lectures arranged through the Scientific Service Committee of the Illinois State Medical Society during March and April are as follows:

March 10, La Salle County Medical Society in Bloomington, Hermann W. Wellmerling, Bloomington, Fractures.
March 22, DeKalb County Medical Society in DeKalb, Roland R. Greene, Chicago, Gynecologic and Obstetric Endocrine Problems.
March 25, McDonough County Medical Society in Macomb, Ben W. Lichtenstein, Chicago, Multiple Sclerosis.
April 8, Kankakee County Medical Society in Kankakee, Charles L. Dunham, Chicago, Rheumatoid Arthritis with Particular Reference to the Differential Diagnosis of Rheumatoid Arthritis and Gout, Disseminated Lupus and Scleroderma.
April 19, Macon County Medical Society in Decatur, Henry Buxbaum, Chicago, Common Obstetrical Problems.
April 21, Logan County Medical Society, Richard Allyn, Springfield, Nephritis.
April 22, McDonough County Medical Society in Macomb, Paul A. Campbell, Chicago, Differential Diagnosis of Hearing Disorders.
April 28, Will-Grundy County Medical Society in Joliet, Philip Thorek, Chicago, Vagotomy for Peptic Ulcer and Ulcerative Colitis.

Chicago

Society News.—The Chicago Dermatological Society on January 19 elected the following officers: Drs. Carl W. Laymon, Minneapolis, president, and James R. Webster, secretary-treasurer.

Gift to Establish Eye Bank.—A check for $50,000 has been received by Mercy Hospital for the establishment of an eye bank to be known as the Patrick A. Nash Memorial in the proposed $6,000,000 new Mercy Hospital on the Near North Side.

Cleft Palate Institute.—Northwestern University has established the Cleft Palate Institute under the cooperation of the schools of dentistry, medicine and speech. A grant of $25,000 from the Clara Abbott Fund of the university will provide partial support. The staff includes John R. Thompson, D.D.S., director and professor of orthodontia in the dental school, where the institute is situated; Dr. Frederick W. Merrifield, plastic surgeon; Harold Westlake, Ph.D., of the school of speech; Touro M. Graber, D.D.S.; Max Kuharich, D.D.S., and Gordon D. Howard, D.D.S., of the dental school, and Raymond Carhart, Ph.D., of the schools of medicine and speech. Patients are referred to the institute by social agencies, schools and doctors in private practice. In addition to giving diagnostic service and making recommendations for treatment, the institute will function as a research and teaching unit.

INDIANA

Postgraduate Course on Malignant Disease.—The second annual postgraduate course on malignant disease is being offered to practicing physicians by the Indiana University School of Medicine, Bloomington-Indianapolis, on April 6-7 with the cooperation of the Indiana Cancer Society. Among the speakers will be Dr. Cornelius P. Rhoads, Memorial Hospital, New York.

Research Wing for James Whitcomb Riley Hospital.—Construction is under way on a $400,000 research wing at the James Whitcomb Riley Hospital for Children, Indianapolis, to provide laboratories and other space for research on diseases of children under the supervision of the Indiana University School of Medicine, Bloomington-Indianapolis. A $250,000 grant in support of this research program has been made by the Riley Memorial Association.

KENTUCKY

Personal.—Dr. Tracy Jones, Harlan, has been appointed director of the Division of County Health Work, Kentucky State Department of Health, succeeding Dr. Richard B. Fulks, who resigned July 1. He will also act as deputy health commissioner.

Dr. Phair Goes to Cincinnati.—Dr. John J. Phair has resigned as director of the Louisville-Jefferson County Board of Health and head of the department of preventive medicine and public health at the University of Louisville School of Medicine to join the faculty of the University of Cincinnati College of Medicine, where he will also devote his time to study and research. Dr. Phair received his M.D. degree from the University of Cincinnati in 1929. He has been a member of the faculties of the University of Cincinnati and Johns Hopkins University, where he received his D.P.H. degree. Before and during the war he served as a medical consultant to the Secretary of War.

LOUISIANA

Personal.—Dr. Charles E. Dunlap, professor of pathology in the Tulane University of Louisiana School of Medicine, New Orleans, has been appointed advisory editor of *Cancer Research*, official publication of the American Association for Cancer Research.

Refresher Course in Pediatrics.—The Louisiana State University School of Medicine, New Orleans, will present a refresher course in pediatrics at Charity Hospital and the medical school March 21-25. This program has been arranged primarily for the family physicians of Louisiana, and the attendance is restricted to 40. Dr. William L. Bradford, University of Rochester (N. Y.) School of Medicine and Dentistry, and Dr. Harry Gordon, University of Colorado School of Medicine, Denver, will assist the Louisiana State University faculty in presenting the program.

MARYLAND

Grant for Research by Dr. McCollum.—The Robert Gould Research Foundation, Cincinnati, has made a grant-in-aid of $5,000 for research in 1949 by Elmer V. McCollum, Sc.D. professor emeritus of biochemistry at the Johns Hopkins University School of Hygiene and Public Health, Baltimore. The fund will enable Dr. McCollum to conduct research aimed at simplifying the method of the separation of amino acids from the products of digestion of proteins.

New Health Television Service.—On December 15 the first of a new series of weekly health television programs "Your Family Doctor," was given over Station WMAR-TV, Baltimore, under the joint auspices of the Baltimore City Health Department and the Medical and Chirurgical Faculty of Maryland. The programs will bring to the public up-to-date information concerning the individual and the community. They are broadcast each Tuesday evening at 8 o'clock on channel 2. The fictitious family doctor for the programs is Dr. John Worthington, a name selected because Dr. Worthington was the first health officer for Baltimore, appointed by the governor in 1792 when yellow fever was present in the community.

MISSOURI

Annual State Medical Meeting.—The Missouri State Medical Association will hold its annual session in the Municipal Auditorium, Kansas City, March 28-30, under the presidency of Dr. Robert Mueller, St. Louis. Out-of-state physicians speaking on the scientific program are as follows:

Joseph T. Roberts, Little Rock, Ark., Pathology of Coronary Artery Disease.
Paul S. Barker, Ann Arbor, Mich., Electrocardiographic Changes in Coronary Disease.
Emmett B. Bay, Chicago, Acute Myocardial Infarction.
Wesley W. Spink, Minneapolis, Undulant Fever.
Winfred Overholser, Washington, D. C., Role of Psychiatry in General Medicine.
Howard R. Mahorner, New Orleans, Modern Surgical Procedures for Carcinoma of the Colon and Rectum.
Francis M. Woods, Brookline, Mass., Problem of Lung Cancer.
Arthur R. Colwell, Evanston, Ill., Treatment of Diabetes Mellitus with Intermediate Insulin.
Andrew C. Ivy, Chicago, and J. Dewey Bisgard, Omaha, Medical and Surgical Standpoints, respectively, of Gastric Pain.

A symposium on trauma will be presented March 29 with Dr. George A. Aiken, Marshall, as moderator of a panel of four physicians from the state. The annual banquet will be held Monday at 7:30 p. m., when Dr. Ivy will speak on "The Dangers of State Medicine."

NEW YORK

Fellowships in Public Health.—The New York State Department of Health is offering fellowships to train physicians to qualify for public health positions in the state. Each carries a stipend of $3,600 a year. Types of training offered include that for health officer, tuberculosis physician, clinical consultant and laboratory director. Information may be obtained by writing to Dr. Franklyn B. Amos, director, Office of Professional Training, New York State Health Department, Albany 1.

Postgraduate Instruction.—The Medical Society of the State of New York with the cooperation of the New York State Department of Health has arranged a lecture to be given at the Arnot-Ogden Memorial Hospital, Elmira, March 16 at 4 p. m. Dr. Stanley E. Bradley, New York, will speak on "Nephritis and Lower Nephron Nephrosis." The Jefferson County Medical Society, meeting March 10 at 8 p. m. in the Hotel Woodruff, Watertown, will hear Dr. Samuel Standard, New York, speak on "Blood and Blood Substitutes."

Lectures on Radium Therapy.—The Educational Committee of the Westchester Cancer Committee has arranged to present three lectures on radium therapy to county physicians at the White Plains Hospital. On February 28 Dr. John Kelly, New York, will discuss the use of radium in the gynecologic field, and Willet F. Whitmore, D.Sc., New York, will speak on the use of radium in the urologic field. On March 7 Dr. William S. MacComb, also of New York, will discuss the use of radium on cancer involving the head and the neck.

New York City

Clinical Research Meeting.—The Committee on Medical Education of the New York Academy of Medicine is extending an invitation to all research workers in greater New York City and neighboring cities within a radius of 100 miles to submit papers on the results of original research in clinical medicine to be presented at a meeting for this purpose June 1. Presentations should be submitted in abstract in triplicate not to exceed 500 words in length to the secretary of the committee not later than April. A formal invitation to participate in the June program will then be extended by the committee to authors of the selected papers. Preference will be given to papers that have not been presented before a national or local society other than intramural. The address is 2 East 103rd Street, New York 29.

Study of Teaching Needs in American University.—Dr. Henry E. Meleney, professor of preventive medicine, New York University–Bellevue Medical Center, has been granted a six months' sabbatical leave to make a study of public health teaching needs at the American University of Beirut, Lebanon. Under a grant from the Commonwealth Fund, Dr. Meleney will prepare a report of teaching needs on the undergraduate and graduate level in the school of medicine. Largest overseas educational institution supported by American philanthropy, the University of Beirut has 2,500 students, representing forty nationalities, mostly from Saudi Arabia, Palestine, Syria, Lebanon and Iraq. Since its founding eighty years ago, it has pioneered in introducing the American type of medical education. Dr. Meleney, a graduate of Columbia University College of Physicians and Surgeons, 1915, was a member of the staff of the Peking (China) Union Medical College for seven years and was associate professor of preventive medicine at Vanderbilt University before coming to the New York University College of Medicine.

Mount Sinai Hospital Expansion Projects.—To meet demands for service and to intensify educational and research activities, the Mount Sinai Hospital of New York has embarked on a $7,000,000 expansion program that will add a ten story maternal pavilion and two research laboratories to its present seventeen building plant. The buildings will have a 160 foot frontage on Central Park and will occupy about two thirds of a city block. The city has added to this lot by deeding to the hospital 99th Street between Fifth and Madison Avenues. The 160 bed maternity building will include an Institute of Biogenetics for education and research. Among its features will be provisions for "rooming-in" of the infant and the mother and an entire floor for 40 premature babies, the latter to be financed partly by a grant from the federal government under the Hill-Burton Hospital Survey and Reconstruction Act. The general laboratory building, a seven story structure, will have a floor space of 50,000 square feet. The hospital's chemistry, physics and bacteriology departments will be moved to this building, and the present quarters will be renovated for the exclusive use of the pathology department. The Institute of Research, named for Dr. Albert A. Berg, hospital staff surgeon who donated funds for its construction, will be limited to specialized investigative work by a small group of researchers. Current expansion will give the hospital, which now services almost 20,000 persons a year, a capacity of 1,000 beds and a group of twenty buildings extending from 101st to 98th Street and from Fifth to Madison Avenue.

PENNSYLVANIA

Conference on Psychiatric Research.—The Western State Psychiatric Institute in Pittsburgh will hold its fourth annual Coordinating Conference March 31-April 1 on the Progress and Implications in Psychiatric Research. Among those appearing on the program are Dr. Oskar Diethelm, New York; Dr. Harry C. Solomon, Boston; Dr. Francis H. Sleeper, Augusta, Maine; Dean Ruth P. Kuehn, Pittsburgh; Miss Ester Garrison, Washington, D. C.; Mrs. Mildred Buchwalder Beck, New York; Elliott Rodnick, Worcester, Mass.; Dr. Frederick Wyatt, Framingham, Mass.; Davenport Hooker, Ph.D., Pittsburgh, and Dr. Warren S. McCulloch, Chicago. The dinner speaker will be Dr. George S. Stevenson, New York, medical director of the National Committee for Mental Hygiene, Inc., and president-elect of the American Psychiatric Association. His subject will be "The Citizen and the Community in the Advancement of Mental Health." All professionally interested persons in Pennsylvania and vicinity are cordially invited to attend.

Philadelphia

Dr. Houssay to Lecture.—The H. B. Shmookler Memorial Lecture of Mount Sinai Hospital will be delivered by Dr. Bernardo A. Houssay, Buenos Aires, Argentina, on "The Role of the Hypophysis in Carbohydrate Metabolism and Diabetes" March 7 at 8:30 p. m. in the Barclay Hotel Ballroom.

Pittsburgh

Audiology Clinic.—The first audiology clinic in Pittsburgh has been installed this year in the Eye, Ear, Nose and Throat Hospital for the treatment of hearing and speech defects. Dr. Lee Doerfler, professor of audiology in Northwestern University, has been named managing director of the department. Serving as executive director is Dr. Kenneth M. Day, hospital staff member.

TEXAS

Dr. Wright Honored.—Dr. Elva A. Wright, Houston, was honored at a special meeting in the auditorium of Baylor University College of Medicine, Houston, marking the presentation by Dr. Wright of a $5,000 fellowship fund to the Texas Medical Center. A portrait of Dr. Wright, pioneer in the treatment of tuberculosis in Harris County, was presented to the hospital. Dr. Richard H. Overholt, Boston, president of the American College of Chest Physicians, spoke on "Surgery's Place in the Treatment of Pulmonary Tuberculosis." The program was sponsored by the staff and board of directors of the hospital and the Harris County Medical Society.

Dr. Burns Goes to Kansas City.—Dr. Beryl I. Burns, administrator of hospitals at the University of Texas Medical Branch, Galveston, and professor of anatomy, has accepted appointment as director of municipal hospitals for Kansas City, Mo., effective in March. While associated with the University of Texas Dr. Burns organized the first broad residency training program to be established in the state. Under his administration over eighty residents and fellows were appointed for the hospital services annually. Dr. Jack R. Ewalt, professor of neuropsychiatry and director of the Galveston State Psychopathic

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Hospital of the university, will succeed Dr. Burns. Dr. Ewalt is a graduate of the University of Colorado School of Medicine, Denver, and has been associated with the Medical Branch of the University of Texas since 1942.

WEST VIRGINIA

Conference of Officers of Component Societies.—Presidents and secretaries of county and area medical societies from every section of West Virginia joined with the eighteen member council of the State Medical Association at a meeting in Charleston on January 9 in initiating a campaign designed to make 1949 a "health and higher education year." The occasion was the annual conference of officers of component societies, and discussion at the all day meeting was limited to public relations, administration and the legislative program, which has the unanimous approval of the council and the fact finding and planning, and legislative committees.

GENERAL

Meeting of Anesthesiologists.—A joint meeting of the American Society of Anesthesiology and its southeastern section will be held April 7-9 at the Statler Hotel, Washington, D. C. The papers to be presented will include among others a proposed plan for postgraduate training in anesthesiology, spinal anesthesia, group practice and thiopental sodium and curare for suspension laryngoscopy. Dr. Lloyd H. Mousel, Washington, D. C.; Edward B. Tuohy, Washington, D. C.; Perry P. Volpitto, Augusta, Ga., and Donald H. Stubbs, Washington, D. C., will preside.

Meeting of Pathologists.—The Middle Eastern regional section of the College of American Pathologists will hold a joint meeting in conjunction with the Philadelphia Pathological Society and the Philadelphia County Medical Society March 10 at the county society building in Philadelphia. The program is as follows:

Milton Rapoport, Philadelphia, Present Status of Micro-Chemical Methods.
John E. Gregory, Philadelphia, Hypersensitivity.
John R. Neefe, Philadelphia, Laboratory Aspects of Hepatitis and Other Liver Diseases.
Nathan Chandler Foot, New York, Melanotic Tumors.
Armand J. Quick, Milwaukee, Laboratory as an Aid in the Diagnosis and Prognosis of the Hemorrhagic Disorders.
Edward D. DeLamater, Philadelphia, Chemistry of Staining Reactions in Common Use by Pathologists.

The guest speaker for the evening program is Dr. William Boyd, Toronto, Canada.

Campaign to Speed Medical Research.—Uniting in a simultaneous effort throughout the United States, ninety-nine national scientific and civic organizations will seek to speed medical research through a campaign during March under the direction of the National Society for Medical Research. The campaign, to be directed against research bans erected by the antivivisection cult, comes at a time when legislative battles on the vivisection question are raging in many states. It will seek to clarify the role of animal experimentation and biologic research. Organizations cooperating include the American Dental Association, American Diabetes Association, American Medical Association, American Public Health Association, American Red Cross, American Veterinary Medical Association, Association of American Medical Colleges, National Research Council, National Foundation for Infantile Paralysis, National Science Teachers Association and U. S. Junior Chamber of Commerce.

Survey of Industrial Health Facilities.—A two year cross sectional survey of industry's health facilities, conducted by Dr. Clarence O. Sappington, Chicago, has been issued by the Industrial Hygiene Foundation, located at Mellon Institute, Pittsburgh. The field study, embracing 277 plants in 33 states and covering an industrial population of 1,180,551 employees, is published as a bulletin entitled "Industrial Health Department Functions and Relationships." Physical examinations of workers are the general rule in industry today, the investigation shows, and in about half the plants surveyed the examinations are used to aid in successful job placement. About 54 per cent of the plants surveyed had industrial hygiene services in some form. The report suggests the following improvements to existing services: (1) more emphasis on having a physician in charge of the service in establishments employing less than 1,500 persons; (2) nurses should work directly under the supervision of a physician, especially in small plants where the physician is on a part time basis; (3) greater use of dispensaries in groups under 1,000; (4) greater improvement generally in the extent and nature of services rendered in plants having less than 1,000 employees; (5) greater improvement for minor surgery and minor illness in these small groups; (6) greater use of periodic examinations in all groups; (7) greater use of industrial hygiene facilities, particularly in plants employing less than 4,000 persons; (8) greater use of dental services in all plants; (9) more instruction in health and safety; (10) physicians should participate in accessory activities such as rehabilitation activities, maintenance of individual health records under medical control, labor relations, job analysis activities and case finding, and (11) the health service department of the corporation should in all instances have the final word on health problems and should be in active and cooperative relationship with top management.

The report brings up to date material contained in Bulletin 99 of the U. S. Public Health Service, written in 1919 and entitled "Medical and Surgical Care of Industrial Workers." The survey is available at $2 per copy from the foundation.

PUERTO RICO

Institute of Forensic Medicine.—The insular government has established the first Institute of Forensic Medicine in a new two story $26,000 annex building to the Municipal Hospital of San Juan, operating under the auspices of the School of Tropical Medicine. It has its own autopsy and crime detention laboratories. The legislature of Puerto Rico approved an appropriation of $25,000 for initial expenses and $45,000 for operating expenses up to June 30. The institute now serves the whole island.

Public Health Association Meeting.—The eighth annual meeting of the Puerto Rico Public Health Association was held February 9-12 at the School of Tropical Medicine in San Juan with Dr. Rafael Timothee presiding. Visiting physicians included Drs. Herman E. Hilleboe, commissioner of health, New York; John B. Hozier, U. S. Public Health Service, New Orleans; Edward G. McGavran, public health school, University of North Carolina, Chapel Hill; W. McKee German, University of Cincinnati College of Medicine; John S. Moorhead, commissioner of health, Virgin Islands, and Glenn S. Usher, Meridian, Miss., U. S. Public Health Service.

FOREIGN

Swiss Internists Meeting.—The annual meeting of the Swiss Society of Internal Medicine will be held in conjunction with the Swiss societies of cardiology and hematology in Lugano May 6-8. Subjects under discussion will be anticoagulants in the prophylaxis and therapy of thrombosis, poliomyelitis and diabetes.

German Congress on Internal Medicine.—The Congress of the German Society of Internal Medicine will be held in Wiesbaden April 25-28 under the presidency of Professor Curt Oehme, Medizinische Universitäts-Poliklinik, Heidelberg. The subjects to be discussed include psychosomatic medicine, protein metabolism and protein therapy, chemotherapy of cancer, tuberculosis and endocarditis and circulatory problems. Application for attendance and for reading papers should be addressed to the president so that the necessary permits to travel in Germany can be furnished in sufficient time.

CORRECTION

Dr. Upham, Past President of the American Medical Association.—In an Ohio news item in THE JOURNAL of February 5, page 391, entitled "Dr. Upham Made Emeritus Member of Board," it was erroneously stated that Dr. Upham's successor on the Ohio State Medical Board was a former president of the American Medical Association. The statement, which was misplaced, refers to Dr. Upham himself, who served the American Medical Association not only as president, but, also, for many years, as a member of the board of trustees and of the Judicial Council.

Marriages

THOMAS C. CLIFFORD, Shipman, Va., to Mrs. Wynanda Bulkley Blake in North Salem, N. Y., September 11.

EDWARD M. KRUSEN JR., Drexel Hill, Pa., to Dr. Ursula M. Leden of Chicago, in Minneapolis, November 13.

WILLIAM STARK to Miss Vivenne R. Rose, both of Washington, D. C., in Baltimore, December 25.

JAMES MATTHEW ANDREW, Columbus, Ohio, to Miss Elaine Laura Flickinger of Akron, September 4.

ROBERT CRAIG SHELBURNE, Rocky Mount, Va., to Miss Louise Hesson at Sweet Briar, September 15.

LEROY LYON HOLT to Miss Anne Elizabeth Owen, both of Birmingham, Ala., September 11.

Deaths

George Herbert Ramsey, Ann Arbor, Mich.; born in Olean, N. Y., in 1891; Columbia University College of Physicians and Surgeons, New York, 1917; later received the doctor of public health degree, Johns Hopkins University School of Hygiene and Public Health, Baltimore; served overseas during World War I; formerly deputy commissioner for the Michigan State Health Department; from 1926 to 1933 on the faculty of Johns Hopkins and later on the faculty of University of Michigan School of Public Health; in 1933 appointed director of the division of communicable diseases for the New York State Department of Health; during his affiliation with Johns Hopkins spent sixteen months with the West African Yellow Fever Commission under the auspices of the International Health Division of the Rockefeller Foundation; served as commissioner of health of Westchester County; member of the American Public Health Association, serving as chairman of the section on epidemiology; past president of the American Epidemiology Society; died in Saranac Lake, N. Y., November 30, aged 57, of tuberculosis and heart disease.

Frank Edward Simpson ✠ Chicago; born in Saco, Maine, Sept. 7, 1868; Northwestern University Medical School, Chicago, 1896; interned at the Cook County Hospital; in 1910 went abroad to study in Vienna and Paris; formerly adjunct professor of dermatology at his alma mater; an Associate Fellow of the American Medical Association; a charter member and one of the early presidents of the American Radium Society; member of the American College of Radiology, Chicago Dermatological Society and the Chicago Roentgen Society; author of "Radium Therapy" and "Radium in Cancer and Other Diseases"; served as attending dermatologist to Cook County Hospital, Henrotin Hospital, Alexian Brothers Hospital, Chicago Policlinic Hospital and the Wesley Memorial Hospital, where he died December 13, aged 79, of cirrhosis of the liver and myasthenia gravis.

Josiah Charles Trent ✠ Durham, N. C.; born in Okmulgee, Okla., Aug. 7, 1914; University of Pennsylvania School of Medicine, Philadelphia, 1938; assistant professor of surgery at Duke University School of Medicine; secretary-treasurer of the Durham-Orange County Medical Society; certified by the National Board of Medical Examiners; member of the American Trudeau Society and the American Association of the History of Medicine; specialist certified by the American Board of Surgery; fellow of the American College of Surgeons; in charge of thoracic surgery at Duke Hospital, where he died December 10, aged 34, of lymphosarcoma.

Lee Campbell Adcock, Fairfax, Va.; Jefferson Medical College of Philadelphia, 1903; served during World War I; for many years senior medical officer with the Civil Service Commission; died in the Arlington (Va.) Hospital December 3, aged 70, of rupture of the aorta.

Elvira Dudley Dean Abell, Madison, N. J.; Cornell University Medical College, New York, 1911; past president of the New Jersey Tuberculosis League; served on the staffs of Memorial and All Souls hospitals in Morristown and the Overlook Hospital in Summit; vice president of the board of managers of the North Jersey Training School for Girls at Totowa; first woman member of the board of directors of Shonghum Mountain Sanatorium in Morristown; died December 8, aged 63, of cerebral hemorrhage.

George Gabriel Armstrong, Portsmouth, Va.; University of the City of New York Medical Department, 1891; member of the American Psychiatric Association; for many years associated with the Connecticut State Hospital in Middletown; died in a local hospital November 22, aged 79.

Conrad Stolzenbach Baker ✠ Willimantic, Conn.; Yale University School of Medicine, New Haven, 1934; specialist certified by the American Board of Anesthesiology, Inc.; certified by the National Board of Medical Examiners; served during World War II; died November 13, aged 39.

Goodman Bare, Anderson, S. C.; Emory University School of Medicine, Atlanta, 1920; member of the American Medical Association; served as county health officer; died October 1, aged 54, of coronary thrombosis.

Daniel Clarke Brennan ✠ Akron, Ohio; Harvard Medical School, Boston, 1912; past president of the Summit County Medical Society; served on the staff of St. Thomas Hospital, where he died November 28, aged 64, of coronary occlusion and diabetes mellitus.

Thaddeus Constantine Cooper ✠ Ogden, Iowa; Northwestern University Medical School, Chicago, 1912; died November 11, aged 69.

Robert Henry Cowley, Berea, Ky.; Western Reserve University Medical Department, Cleveland, 1901; specialist certified by the American Board of Otolaryngology; for many years affiliated with Berea College Hospital, where he died November 20, aged 77, of coronary heart disease.

Albert Elmer Cross ✠ Worcester, Mass.; Boston University School of Medicine, 1900; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology and the New England Ophthalmological Society; formerly member of the school committee; served in an advisory capacity to the local draft board during World War I; member of the board of governors of the Hahnemann Hospital; died in Bennettsville, S. C., November 6, aged 76, of coronary occlusion.

Charles James Dean, Portland, Ore.; Chicago College of Medicine and Surgery, 1909; died in the Providence Hospital November 22, aged 64, of arteriosclerotic cardiovascular renal disease.

Eugene G. Fendley, Leslie, Ark. (licensed in Arkansas in 1903); member of the American Medical Association; died November 1, aged 66, of heart disease.

Robert Leslie Ferguson ✠ Arkansas City, Kan.; Kansas City (Mo.) Medical College, 1903; died November 5, aged 74, of cirrhosis of the liver.

George Ray French, Andover, Ohio; Western Reserve University Medical Department, Cleveland, 1896; member of the American Medical Association; past president of the Geauga County Medical Society; died November 17, aged 75, of coronary thrombosis.

Charles Albert George, Springfield, Mo.; Washington University School of Medicine, St. Louis, 1903; member of the American Medical Association; formerly county coroner and city health commissioner; died in St. John's Hospital November 19, aged 67, of cerebral arteriosclerosis.

George Benjamin Gilmore ✠ Colorado Springs, Colo.; Northwestern University Medical School, Chicago, 1903; formerly secretary-treasurer of the El Paso County Medical Society; formerly city health officer; affiliated with the Glockner-Penrose Hospital, St. Francis Hospital and Sanitarium and Memorial Hospital, where he died November 28, aged 67, of nephritis.

Eustace Thomas Goff ✠ Parkersburg, W. Va.; University College of Medicine, Richmond, 1913; member of the American College of Chest Physicians; died November 22, aged 62, of heart disease.

Julian De Voine Guyot, Jefferson City, Mo.; Jefferson Medical College of Philadelphia, 1906; member of the American Medical Association; died November 3, aged 64, of pneumonia.

Merit Donald Haag ✠ Toledo, Ohio; University of Michigan Medical School, Ann Arbor, 1918; specialist certified by the American Board of Obstetrics and Gynecology; member of the Central Association of Obstetricians and Gynecologists; fellow of the American College of Surgeons; affiliated with Lucas County and Toledo hospitals; died suddenly in Dunedin, Fla., January 6, aged 56, of cerebral hemorrhage and hypertension.

William Scott Hartford, Champaign, Ill.; Hering Medical College, Chicago, 1906; served during World Wars I and II; died in Glendale, Calif., November 6, aged 64.

James Clarke Healy, Boston; Tufts College Medical School, Boston, 1927; member of the American Medical Association; assistant professor of pharmacology at his alma mater; affiliated with the Boston City Hospital; died November 19, aged 46, of pulmonary tuberculosis.

William H. Hendricks, Tifton, Ga.; St. Louis College of Physicians and Surgeons, 1897; member of the American Medical Association; an officer during World War I; served as mayor of Tifton, and as senator and representative from Tift County; killed in a traffic accident November 15, aged 75.

John Martin Hogan ✠ Oshkosh, Wis.; Rush Medical College, Chicago, 1902; formerly medical director of the Wisconsin National Life Insurance Company; on the staffs of Mercy, St. Mary's and Alexian Brothers' hospitals; one of the founders of the Oshkosh Clinic; died November 19, aged 72, of coronary disease.

William Clyde Hogan ✠ Bradford, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1902; fellow of the American College of Surgeons; member of the Association of Military Surgeons of the United States; served during World War I; on the staff of Bradford Hospital, where he died November 20, aged 74, of cerebral thrombosis with paralysis.

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Albert Roy Hogg, Lexington, Ga.; University of Georgia Medical Department, Augusta, 1905; died November 23, aged 67.

Charles Edward Horner, Williamsburg, Ky.; Eclectic Medical Institute, Cincinnati, 1907; died recently, aged 66.

Lawson Udell Hurlburt, Norwood, N. Y.; University of the City of New York Medical Department, New York, 1890; member of the American Medical Association; died November 17, aged 87, of arteriosclerotic heart disease.

William Bernard Johnston, Reno, Nev.; Johns Hopkins University School of Medicine, Baltimore, 1901; died November 19, aged 72, of coronary occlusion.

Edward Winslow Jones ✦ Pasadena, Calif.; University of California Medical School, San Francisco, 1930; formerly an officer in the regular navy; died in November, aged 48.

William Edward Kelly ✦ Middletown, N. Y.; Hahnemann Medical College and Hospital of Philadelphia, 1904; specialist certified by the American Board of Pathology, Inc.; member of the American Psychiatric Association and the American Society of Clinical Pathologists; affiliated with the Goshen (N. Y.) Hospital and St. Francis Hospital in Port Jervis; for many years pathologist at the Middletown State Homeopathic Hospital, where he died November 24, aged 71, of cerebral hemorrhage.

Samuel Markle Kirkwood, Batavia, N. Y.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1892; died in Genesee Memorial Hospital November 23, aged 83, of cerebral hemorrhage.

Inez Lapsley, McAfee, Ky.; Laura Memorial Woman's Medical College, Cincinnati, 1901; fellow of the American College of Surgeons; served on the staff of Christ Hospital in Cincinnati; died November 19, aged 74, of heart disease.

David Henry Lawrence Jr. ✦ Denver; University of Colorado School of Medicine, Denver, 1932; assistant professor of surgery at his alma mater; certified by the National Board of Medical Examiners; specialist certified by the American Board of Surgery; fellow of the American College of Surgeons; affiliated with Denver General, Colorado General, St. Luke's, Children's, Mercy and Presbyterian hospitals; died in November, aged 41.

George Donald Livingston, Detroit; Wayne University College of Medicine, Detroit, 1938; member of the American Medical Association; served during World War II; affiliated with Grace and St. Mary's hospitals; died November 14, aged 35, of coronary thrombosis.

Irving Bigley Love ✦ Milwaukee; Marquette University School of Medicine, Milwaukee, 1923; school physician for the city health department for many years; on the staff of St. Mary's Hospital; died in St. Mary's Hospital, Madison, November 23, aged 52, of cerebral hemorrhage.

William DeVoe Lyman ✦ Grand Rapids, Mich.; Grand Rapids Medical College, 1906; fellow of the American College of Surgeons; served during World War I; affiliated with St. Mary's and Blodgett Memorial hospitals; died November 21, aged 72, of cerebral hemorrhage.

Franklin Pierce Lynch, New York; University of the City of New York Medical Department, 1891; for many years a medical missionary in the Belgian Congo; died in the Roosevelt Hospital November 20, aged 89.

Howard N. Lyon, Chicago; the Hahnemann Medical College and Hospital, Chicago, 1888; died in Morris November 29, aged 81, of cerebral arteriosclerosis and arteriosclerotic heart disease.

James McGehee McAnally ✦ Reidsville, N. C.; University of Pennsylvania School of Medicine, Philadelphia, 1927; past president of the Rockingham County Medical Society and the Eighth District Medical Society; on the staff of the Memorial Hospital; surgeon for the Southern Railway; died in Baptist Hospital, Winston-Salem, N. C., recently, aged 46, of coronary thrombosis.

Wheeler Scott McCall, St. Louis; Barnes Medical College, St. Louis, 1910; served during World Wars I and II; died in the Veterans Administration Hospital, Jefferson Barracks, Mo., November 20, aged 61, of hypertension and myocardial infarction.

Fenton Elmer MacCallum, Pulaski, N. Y.; Baltimore Medical College, 1900; health officer of the town of Richland; member of the American Medical Association; died October 28, aged 72, of coronary thrombosis.

Luther Love McDougal Sr., Booneville, Miss.; University of Louisville (Ky.) Medical Department, 1907; member of the American Medical Association; past president of the Northeast Mississippi Thirteen County Medical Society; formerly secretary of the Prentiss County Medical Society; for many years member of the state board of health; formerly superintendent of the Mississippi State Hospital, Whitfield; died in the North East Mississippi Hospital, November 19, aged 70.

Robert Louis McGee ✦ Raleigh, N. C.; University of Pennsylvania School of Medicine, Philadelphia, 1932; specialist certified by the American Board of Surgery; fellow of the American College of Surgeons; affiliated with Rex Hospital, where he died November 11, aged 41, of polioencephalomyelitis.

Charles A. J. McKenna, Scarsdale, N. Y.; Fordham University School of Medicine, New York, 1921; served during World War I; medical examiner for the New York State Department of Labor; formerly affiliated with the Manhattan Eye, Ear and Throat Hospital and Misericordia Hospital in New York; died November 23, aged 52.

Mack Laughlin McKinnon ✦ Lauderdale, Miss.; University of Tennessee Medical Department, Nashville, 1910; died in Rush Memorial Hospital, Meridian, November 20, aged 63, of a skull fracture received in an automobile accident.

Harry Gray McNamee Jr., Memphis, Tenn.; University of Tennessee College of Medicine, Memphis, 1937; member of the American Medical Association; formerly on the faculty of his alma mater; served during World War II; died in Kennedy Hospital, November 7, aged 36, of glioblastoma.

Alexander McRobbie, Swampscott, Mass.; University of Aberdeen Faculty of Medicine, Scotland, 1904; died November 21, aged 73, of coronary occlusion.

John Henry Miller Madden, Columbia, S. C.; Johns Hopkins University School of Medicine, Baltimore, 1939; member of the American Medical Association; secretary treasurer of the Second District Medical Society; served overseas during World War II; affiliated with Columbia Hospital, Providence Hospital and the Baptist Hospital, where he died November 21, aged 35.

Frederick Fletcher Malony, Dundee, N. Y.; Yale University School of Medicine, New Haven, 1901; member of the American Medical Association; served as county coroner; affiliated with the Soldiers and Sailors Memorial Hospital in Penn Yan and the Geneva (N. Y.) Hospital; died November 29, aged 73.

Joseph Mandelberg, Brooklyn; Cornell University Medical College, New York, 1919; served with the Veterans Administration; died November 12, aged 55, of coronary thrombosis.

George Francis Mangone ✦ Union City, N. J.; University and Bellevue Hospital Medical College, New York, 1925; health officer; affiliated with the French Hospital in New York and Christ Hospital in Jersey City, where he died November 20, aged 47, of congestive heart failure and coronary sclerosis.

Otis W. Martin ✦ Ralston, Neb.; University of Nebraska College of Medicine, Omaha, 1917; for many years associated with the Union Pacific Railway; served during World War I; died November 7, aged 57, of carcinoma of the kidney with metastases.

Stonewall Jackson Martin, Bowling Green, Ky.; University of Louisville (Ky.) Medical Department, 1904; died November 14, aged 82, of pneumonia.

Samuel Abbot Volpert ✦ Lake Placid, N. Y.; Syracuse University College of Medicine, 1922; past president of the Essex County Medical Society; on the staff of General Hospital in Saranac Lake and Lake Placid General Hospital; died November 27, aged 49, of coronary thrombosis.

Justin Miner Waugh ✦ Cleveland; Columbia University College of Physicians and Surgeons, New York, 1898; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; served overseas during World War I; affiliated with the Cleveland Clinic; died in Cleveland Clinic Hospital November 24, aged 76, of cerebral hemorrhage.

Samuel Weinberg ✦ Baltimore; College of Physicians and Surgeons, Baltimore, 1901; died November 26, aged 68, of coronary thrombosis.

Edison Kerl Westhafer, New Castle, Ind.; Central College of Physicians and Surgeons, Indianapolis, 1905; member of the American Medical Association; served during World War I; formerly associated with the U. S. Public Health Service; died in Henry County Hospital November 9, aged 70, of coronary occlusion.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan. 22, 1949.

The Working of the National Health Service

In the House of Commons a discussion has taken place on the working of the National Health Service, which was criticized by the opposition and defended by the Government. Sir H. Morris-Jones, a national liberal member, said that a large number of doctors were unhappy about many of the workings of this act; that in large industrial areas they had, on the whole, gained somewhat in remuneration; that in all other areas their incomes had gone down so seriously as to affect the morale and working power of the practitioner; that the whole basis of remuneration should be reconsidered; that there was much to be said for payment for each attendance, with a certain ceiling, whereby the state could make a grant-in-aid; that the basic salary was working very badly, and that the distribution of doctors was infinitely worse than ever. A conservative member asked whether the medical profession was not much overworked, with the consequence that it had insufficient time to give to serious illness. Were the people who really needed them getting the hospital beds?

For the Government Mr. L. J. Edwards, Parliamentary Secretary, Ministry of Health, said that there was no longer any doubt that the Health Service had been welcomed and used by all classes to an extent beyond expectation! In the family practitioner service some 40,000,000 have placed their names on doctors' lists. That is between 95 and 98 per cent of the total population. A 3 per cent margin of error was allowed for. Out of a total of about 21,000 general practitioners 18,165 have come into the scheme. They have written 75,000,000 prescriptions for medicines or appliances since the service began. Out of about 10,000 dentists in general practice 8,988 are now in the scheme. They have treated 2,200,000 patients, and a further 1,200,000 are under treatment at present. It looks as though the initial peak demand for dental services has passed, but the demand is still running at the rate of 130,000 patients a week. Over 2,500,000 persons have had their sight tested, and over 3,000,000 pairs of glasses have been supplied or are on order. It should be borne in mind that all these figures refer to a period of about six months during which the service has existed.

On the question of payments to doctors the Minister said that up to March 31 next they were estimated at $130,000,000, in addition to which there were contributions from the Government for superannuation amounting to $6,400,000. It was agreed with the profession that the mileage payments to rural doctors for 1947 should be increased to $5,200,000, but it is clear that this would not be sufficient to meet their needs, and the Government has agreed to provide a further $2,000,000 a year.

Annual Meeting of the Association of Surgeons

The annual meeting of the Association of Surgeons of Great Britain and Ireland will be held in Dublin on May 26-28. The discussions arranged are as follows: "Surgical Ritual," to be opened by Sir Hugh Cairns, Sir R. Watson-Jones, Mr. Julian Taylor, Mr. F. Gill and Mr. D. M. Douglas; "The Use and Abuse of Streptomycin," by speakers to be announced later; "The End Results and Treatment of Injuries of Peripheral Nerves," to be opened by Mr. H. J. Seddon; other speakers to be announced later. Fellows and associate fellows are invited to submit the titles and precis of short papers to the honorary secretary by the end of January. Those requiring accommodation in Dublin should apply as soon as possible to Hewett's Travel Agency, Hewett's Corner, D'Olier St., Dublin.

Freedom of Britain from Epidemic Influenza

This country has been singularly free from epidemic influenza in recent years. In the first quarter of 1948 the deaths from influenza in the great towns reached the lowest figure ever recorded. So far there is no indication this year of any epidemic of influenza in England. But Italy, France and Belgium have been suffering from epidemics of mild type, probably due to the influenza B virus. Two persons arrived in London from Paris on January 5 and showed symptoms suggestive of influenza. It is likely that during the past fortnight there have been numerous similar importations, but there is nothing to suggest that the disease is already spreading. While dissemination of the virus is almost inevitable, the outbreak need not necessarily reach epidemic proportions. The Ministry of Health has issued in the press "the golden rule" that anyone who has a headache, pains in the limbs and fever should go to bed in a room by himself and remain there under medical care until he recovers. Though it is free from influenza in epidemic form, scattered cases continue to occur from time to time throughout the country.

New Health Records

The vital statistics for 1948 show three new health records. As the National Health Service did not come into force until the middle of the year, credit cannot be claimed for this, as it probably would if the service covered the whole year. The deaths registered in England and Wales during 1948 numbered 470,282, the lowest for eighteen years, in spite of an increase of population amounting to 3,500,000. This represents a record low death rate of 10.8 per thousand of population. There were 266,635 deaths of children under one year of age, giving a rate of 34 per thousand related to live births. This is the first time that the annual rate has fallen below 40, the previous lowest being 41. Stillbirths numbered 18,415, giving a rate of 23.1 per thousand live and stillbirths. This is also the lowest rate ever recorded. The number of live births was 777,648, a reduction of 109,172 from the peak of 886,820 in 1947 but substantially above prewar levels. The rise in the birth rate during and immediately after the war has been pointed out in previous letters to THE JOURNAL. It was explained as largely due to the marriage allowances paid to soldiers' wives. This is confirmed by the great fall in the birth rate which followed in the years of peace.

THE NETHERLANDS

(From Our Regular Correspondent)

AMSTERDAM, Jan. 25, 1949.

Health Districts for Medical Training and Research at Batavia

Dr. J. W. Tesch, who was assistant of Prof. Dr. J. E. Dinger, director of the Queen Wilhelmina Institute for Hygiene and Bacteriology of the Faculty of Medicine, Batavia, published a fascinating report on "The Hygiene Study Ward Center at Batavia" (Thesis University of Leyde, 1948).

The plan for this study ward was conceived by the late Prof. E. Walch. This outstanding hygienist, himself a pupil of the School of Hygiene at Baltimore, was guided in this plan by the experience in the United States, where, in the neighborhood of various schools of hygiene, a quarter of the town is allocated as a study ward for the students. After his tragic death his idea has materialized under his successor, Professor Dinger, with the aid of the Public Health Service, the Queen Wilhelmina Jubilee Foundation and the Rockefeller Foundation.

The Study Ward was established in the Tanah Tinggi ward of the Senen subdistrict of Weltevreden, a section of Batavia with a population of 25,000.

The staff under the physician in charge consists chiefly of a midwife, a nurse for infants and preschool children, 4 home

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visitors (investigators) and an instructor of the visitors. The midwife does not attend confinements but collects all possible data regarding pregnancy, confinement and lying-in. She visits the pregnant women, traced by the investigator in their homes and urges them to avail themselves if necessary of expert assistance, which is then given by a midwife of one of the obstetric institutions operating in the ward.

The investigators make regular rounds, each in his own territory, collecting information regarding pregnancy and the hygienic and demographic conditions; keeping a look out for cases of sickness, for pregnant women and for infants found not to have birth certificates, and distributing bottles for the collection of fecal matter and sputum and making blood smears for malaria tests.

The instructor of the investigators calls on the families in which there are cases of sickness and arranges the further epidemiologic research work under the supervision of the physician in charge. The nurse for children makes a house to house call on all the newborn babies and makes propaganda for visits to the hygiene center. In the program of activities one finds as the most important subjects: the census of the population, vital statistics, environmental conditions, individual hygiene and preventive medicine, diet investigations and the epidemiology of typhoid, different forms of dysentery, worm infestations, tuberculosis, diphtheria, malaria, yaws, leprosy, measles, leptospirosis and filariasis.

During four years of work done in the study ward, a new census has been organized comprising a classification of the population according to occupation, economic status, etc., and a new apparatus for the registration of births. The environmental conditions were carefully studied and much attention was given to personal hygiene which, according to the author, will have a prominent place in the future of public health.

Regarding the epidemiology of typhoid, bacillary dysentery and diphtheria, rates were obtained of the frequency of bacillus carriers, contact and immune persons. The supposition that there must be many slight and unrecognized cases of typhoid among the population of the native districts of Batavia is not confirmed by this research, although in the surface water a heavy contamination with fecal bacteria and typhoid bacteria was found. This gives rise to another supposition, namely, that the contact with this surface water, besides spreading real cases, produces subclinical immunizing infections, which lead to an active immunity against typhoid.

Bacillary dysentery again showed itself to be one of the most important tropical diseases; relatively many carriers were found among persons chosen at random and among persons who had come in contact with dysentery patients. The results of the postmortem examinations are surprising indeed, as in 14 per cent of persons who had died of all kinds of diseases dysentery bacilli were traced. The morbidity and the mortality of bacillary dysentery among the group up to 4 years of age appeared to be thirty to forty times as great as among the older children and the adults.

The author obtained the general impression that in tropical surroundings a more rapid immunization against diphtheria takes place. The native school children of the study ward in the age group 5 to 6 years already showed a high incidence of Schick-negative reactions.

It may be expected that the investigations and survey described by Dr. Tesch are to be continued as soon as conditions will permit. The work in the study ward is of high educational and didactic value. At the same time it opens a rich field of epidemiologic research and stimulates the authorities who are responsible for the sanitary conditions in the district.

MADRID

(From Our Regular Correspondent)

Feb. 10, 1949.

Thrombophlebitis

At the annual meeting of the Sociedad Española de Cardiología, Nov. 27, 1948, at the Asociación de Médicos de Madrid, Dr. Fernando Martorell of Barcelona read an excellent article on "Phlebothrombosis and Thrombophlebitis of the Limbs." This article was based on careful observation by the speaker of 971 cases. Two hundred and twenty-two were in the acute phase, whereas 750 were seen in the phase of the sequels. From the etiologic point of view, puerperal thrombophlebitis is the most frequent. Primary thrombophlebitis is second in frequency. Pulmonary embolism occurred in 140 patients. It ushered in the clinical symptoms of thrombophlebitis in 70 cases and appeared after the clinical symptoms of thrombophlebitis in 66 cases. In the group of patients with sequels, 222 had edema, 172 induration and 341 ulcers. The speaker reviewed Oschner's and Bakey's theories on phlebothrombosis and thrombophlebitis. The differentiation is useful with respect to certain aspects of the disease, but it is advisable to retain the name thrombophlebitis in its generic sense, to prevent possible confusion. In the therapeutic field, it is obvious that immobilization of the thrombophlebitic limb is harmful, whereas in some cases administration of spasmolytic drugs and anesthesia of the sympatheticus are of value. Concerning the value of anticoagulants, the speaker emphasized that heparin gives good results whereas dicumarol® is dangerous and of less efficacy than heparin. However, dicumarol® should be resorted to in patients in whom heparinization is impossible and in those who had heparinization with a consequent favorable course of the disease and in whom prolongation of the anticoagulant effect is indicated. Operation is indicated only on thrombosed varicose veins, on thrombosis causing embolism and on septic thrombophlebitis. Active mobilization of the limbs is indicated as the best prophylactic measure. In the course of the sequels the postphlebitic ulcer is a frequent and painful complication. Lumbar ganglionectomy followed by extensive removal of the ulcer and application, with suture, of a free graft constitutes the recommended treatment. The graft is obtained with Padget's dermatome. Drs. C. Jiménez Díaz, of Madrid, the president of the Sociedad Española de Cardiología; Rodriguez Arias, of Barcelona, and A. Buylla, Varela and F. Vega Díaz, all from Madrid, took part in the discussion of Dr. Mortorell's article.

Appoint Professor of Histology

Dr. J. L. Arteta was recently appointed professor of histology and pathologic anatomy of the Faculty of Medicine of Santiago de Compostela. His appointment was made by unanimous vote of all the members of the faculty. Dr. Arteta belongs to the school of Cajal. He was a pupil of Dr. J. F. Tello. He has held the following positions: assistant professor of histology and pathologic anatomy of the Faculty of Medicine of Madrid from 1940 to 1944; head of department of autopsies of the Hospital General of the Department of Pathologic Anatomy, of which Dr. M. Perez Lista is the director, and, most recently, professor of pathoiogic anatomy of the Escuela Nacional de Tisiologia. Dr. Arteta is a permanent collaborator of the Instituto de Patología Médica, of which Professor Dr. G. Marañón is the director. He has published several articles in collaboration with Dr. Marañón. His articles on the nervous system are important, especially on the following subjects: changes of microglias on different experimental conditions; pathologic anatomy of the pellagrous tongue, and new technics of impregnation of the nervous system. He developed a rapid technic of biopsy, which is a modification of Terry's technic.

Correspondence

DIABETES

To the Editor: An unfortunate error appeared in THE JOURNAL of January 1 which tended to reflect on the validity of my reported observations on vascular damage in diabetes mellitus. Dr. Elliott P. Joslin in his article, "Furtherance of Treatment of Diabetes Mellitus" (page 1) cited my study of 200 patients but inadvertently referred to the number as 20!

In critically evaluating these observations, Dr. Joslin unfortunately used as his source an abstract of a preliminary report rather than the more detailed paper which appeared in THE JOURNAL on Aug. 16, 1947. With respect to the manner in which the data were obtained, a point which seems to have disturbed Dr. Joslin, readers of THE JOURNAL will recall that "the patients were selected from the Metabolism Clinic of the Mount Sinai Hospital and private practice on the basis of detailed medical records dating from the onset of diabetes, with emphasis on regular ophthalmoscopic examinations, determinations of blood pressure and complete urinalyses."

A distinguished member of Dr. Joslin's own clinic, Dr. Priscilla White, makes an observation almost identical with mine, noting that "vascular disease occurred in 93 per cent of 220 juveniles surviving twenty or more years of diabetes." This is not materially different from my report of 100 per cent vascular damage in twenty-five years.

In fact, Dr. Joslin himself states in his JOURNAL article of January 1 that "more than 60 per cent of my diabetic patients die between the fifth and twentieth year of their diabetes." It seems to me that he and his associate, Dr. White, have proved my case.

No one regrets the existence of a pessimistic outlook on diabetes more than I, but no useful purpose can be served by denying the evidence which has been demonstrated. On Oct. 5, 1947 at the Seminar on Degenerative Lesions of Metabolism sponsored by the National Institute of Health, the chairman, Dr. Joseph H. Barach, opened the session by stating "So far, almost everyone who has discussed this topic seems to have corroborated Dolger's observations and faced the grim facts. Out of this, there will finally come a revaluation of our knowledge on the subject, and we will be better off for it."

HENRY DOLGER, M.D., New York.

NOTE.—The letter was referred to Dr. Joslin, who replies:

To the Editor:—No one in the world probably appreciated the significance of Dr. Dolger's work on the prevalence of vascular damage in diabetes more than I. Most unfortunately I missed that error in the proof and the figure "20" instead of the correct figure of "200" cases went into the published text, although my duplicate of the text shows my paper had the correct figure.

It may be of interest to the readers that Dr. Dolger's comment was a challenge to us all, and now we have 5 of our own cases, 1 case from the University of Iowa at Iowa City and another from the Mayo Clinic, in which the patients have lived not twenty years, but twenty-five years with diabetes and show no sign of degenerative disease in the eyes, in the heart, in the kidneys or in the aorta (including lateral roentgenograms), in the pelvic arteries and vessels of the legs.

Dr. Dolger's work was most stimulating, and when a sufficient number of these exceptional cases are collected, it will be of great value to trace the treatment they have followed during their quarter century or more of diabetes.

ELLIOTT P. JOSLIN, M.D., Boston.

FLUORESCEIN

To the Editor:—I was most interested in the work of Menaker and Parker, "Fluorescein: An Adjunct in Surgery of Extrahepatic Biliary Passages," in THE JOURNAL of Dec. 4, 1948. Dr. C. J. Sutro and myself did the same thing many years back. This work was collateral to the use of filtered ultraviolet radiation in orthopedic pathology. The references to our publications are these:

1. Visualization of the Biliary System by Fluorescence: Results of Animal Studies Following Intravenous Injection of Mercurochrome-220 Soluble or Direct Injection of the Dye Into the Gall Bladder, J. A. M. A. **99**: 2024 (Dec. 10) 1932.

2. Examination of Tubular Organs and Arterial Systems of Rabbits by Filtered Ultraviolet Radiation, *Arch. Surg.* **28**: 867-873 (May) 1934. Photographs of the gallbladder, the extrahepatic biliary ducts and duodenum before and after exposure to filtered ultraviolet radiation were shown.

3. Practical and Experimental Uses of Fluorescein in Medicine, *Arch. Phys. Therapy*, **16**: 71-73, 1935.

The late Dr. Philip Grausman, attending surgeon of the Hospital for Joint Diseases, injected at our request 20 cc. of a 0.06 per cent watery solution of acriflavine into the gallbladder of each of 2 patients before the gallbladder was removed. The dye fluoresced a golden yellow under filtered ultraviolet radiation in the darkened room. The common duct and the second portion of the duodenum were outlined well. Dr. Grausman supplied us with fluorescein powder for further investigation, especially the intravenous injection of a fluorescein solution. (Fluorescein is the mother substance of merbromin ["mercurochrome"]). This was not done because of the press of other work.

It is to Lange's credit that he demonstrated the value of fluorescein in the study of circulatory adequacy. The good work of Menaker and Parker is equally applicable in the surgery of other tubular structures.

MICHAEL BURMAN, M.D., New York.

VAGOTOMY FOR PEPTIC ULCER

To the Editor:—The report of Drs. Paulson and Gladsden (THE JOURNAL, January 15, page 151) involves a problem of interest to those surgeons performing vagotomy for the therapy of peptic ulcer and to other scientists who attempt to explain the results of this operation. Paulson and Gladsden report that the pyloric sphincter as well as the remainder of the stomach becomes more relaxed after vagotomy and that the delayed gastric evacuation resulting from this operation cannot be due to pylorospasm. This report emphasizes the fact that the physiology of the sphincter is of clinical as well as academic interest.

Many investigators, employing rather indirect experimental methods, have concluded that the pyloric sphincter reacts in a manner opposite to the remainder of the stomach. Paulson and Gladsden emphasize that if this were true, vagotomy, which depresses gastric tone and motility, should stimulate the sphincter and retard gastric evacuation by producing pylorospasm.

Since 1937 our laboratory has employed a variety of rather direct methods of studying the sphincter and has uniformly observed that in regard to its motor activity, the gastroduodenal region (antrum, sphincter and bulb) behaves as a unit. Contrary to older reports, all three regions are similarly inhibited by the presence of fats, fatty acids or hydrochloric acid in the upper intestine or by pain and other noxious impulses or by drugs which block parasympathetic nerves. We also demonstrated that the delayed gastric emptying associated with these factors results from a decrease in antral pumping activity and occurs in spite of a relaxed pyloric sphincter.

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Thus, the fact that vagotomy delays gastric evacuation and also relaxes the sphincter as Paulson and Gladsden have demonstrated by an acceptable method (gastroscopic observation) is not "surprising." Actually, it is in accord with the newer knowledge obtained by other critical technics and it confirms the modern evidence that the behavior of the sphincter is similar to and not contrary to that of the adjacent portions of the digestive tract.

J. P. QUIGLEY, PH.D.
DANIEL A. BRODY, M.D.
The University of Tennessee.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: *Parts I and II.* Various Centers. June 20-22, Sept. 12-14. *Part II.* April 25-26. Exec. Sec., Mr. E. S. Elwood, 225 S. 15th St., Philadelphia 2.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY, INC. *Written.* Various Centers. July 15: Final date for filing application is April 15. *Oral.* April 10-14 and Oct. 16-20. Sec., Dr. Curtiss B. Hickcox, 745 Fifth Ave., New York 27.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Oral.* New York City, April 1-3. Sec., Dr. George M. Lewis, 66 East 66th Street, New York 21.

AMERICAN BOARD OF INTERNAL MEDICINE: *Oral.* New York City, March 23-25. Philadelphia, June 1-3. *Written.* Oct. 17. Final date for filing application is May 1. Asst. Sec.-Treas., Dr. W. A. Werrell, 1 Main St., Madison 3, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: *Oral.* Chicago, June 1949. Sec., Dr. W. J. German, 310 Cedar Street, New Haven, Conn.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY, INC.: *Oral.* Chicago, May 8-14. Final date for filing application is April 1. Sec., Dr. Paul Titus, 1015 Highland Building, Pittsburgh 6.

AMERICAN BOARD OF OPHTHALMOLOGY: *Oral.* San Francisco, March 21-24; New York, June 11-15; St. Louis, Oct. 15-19; Boston, Dec. Sec., Dr. S. J. Beach, 56 Ivie Rd., Cape Cottage, Maine.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY. *Part I.* Various Centers. *Part II.* New York City, Jan. 1950. Sec., Dr. Harold A. Sofield, 6 N. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: New York, May 11-14; Chicago, Oct. 4-7. Sec., Dr. D. M. Lierle, University Hospital, Iowa City.

AMERICAN BOARD OF PATHOLOGY: Boston, April. Final date for filing application is March 1. Sec., Dr. Robert A. Moore, 507 S. Euclid Ave., St. Louis 10, Mo.

AMERICAN BOARD OF PEDIATRICS: *Oral.* Baltimore, May 7-9. Exec. Sec., Dr. John McK. Mitchell, 6 Cushman Rd., Rosemont, Pa.

AMERICAN BOARD OF PHYSICAL MEDICINE: Atlantic City, June 4-5. Final date for filing application is March 15. Sec., Dr. R. L. Bennett, 30 N. Michigan Blvd., Chicago.

AMERICAN BOARD OF PLASTIC SURGERY: Examinations are given in June and November of each year in the home town of applicants. Sec., Treas., Dr. Louis T. Byars, 400 Metropolitan Bldg., St. Louis, Mo.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY, INC. December, New York City. Sec., Dr. F. J. Braceland, 102-110 Second Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF RADIOLOGY. Atlantic City, June 2-4. Sec., Dr. B. R. Kirklin, 102-110 Second Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF SURGERY. *Written.* Various Centers, March and October. Final date for filing application for October examination is July 1. Sec., Dr. J. Stewart Rodman, 225 S. 15th St., Philadelphia.

AMERICAN BOARD OF UROLOGY: Feb. 1950. Sec., Dr. Harry Culver, 7935 Sunnyside Road, Minneapolis 18, Minn.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: *Examination.* Montgomery, June 28-30. Sec., Dr. D. G. Gill, 519 Dexter Ave., Montgomery.

ALASKA: * Juneau, March 1. Sec.-Treas., Dr. W. M. Whitehead, Box 140, Juneau.

ARKANSAS: * Little Rock, June 9-10. Sec., Dr. L. J. Kosminsky, Texarkana. *Eclectic.* Little Rock, June 9-10. Sec., Dr. C. H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Examination,* Los Angeles, Feb. 28-March 3. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento.

COLORADO: * *Endorsement,* Denver., April 5. *Written,* Denver, June 20-22. Sec., Dr. W. W. King, 831 Republic Bldg., Denver 2.

CONNECTICUT: * Hartford, March 8-9. Secretary to the Board, Dr. Creighton Barker, 258 Church Street, New Haven.

DELAWARE: Dover, July 12-14. Sec., Dr. J. S. McDaniel, 229 South State St., Dover.

DISTRICT OF COLUMBIA: * *Reciprocity,* Washington, March 14. *Written,* Washington, May 9-10. Sec., Dr. George C. Ruhland, 4130 Municipal Bldg., Washington.

FLORIDA: * *Examination,* Jacksonville, June 26-28. Sec., Dr. Frank D. Gray, 12 N. Rosalind Ave., Orlando.

GEORGIA: *Examination.* June, Atlanta and Augusta. *Reciprocity.* Atlanta, June. Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta.

GUAM: *Endorsement.* Agana, Last Friday of each month. Sec., Capt. C. K. Youngkin, Dept. of Public Health, Guam, % F.P.O. San Francisco, Calif.

ILLINOIS: Chicago, April 12-14. Supt. of Registration, Mr. Fred W. Ruegg, Capitol Bldg., Springfield.

INDIANA: *Examination.* Indianapolis, June. Sec., Board of Medical Registration and Examination, Dr. Paul R. Tindall, 416 K. of P. Bldg., Indianapolis.

IOWA: * *Examination.* Iowa City, June 13-15. Sec., Dr. M. A. Royal, 506 Fleming Bldg., Des Moines.

KANSAS: Kansas City, June 1-2. Sec., J. F. Hassig, 905 North 7th St., Kansas City, Kans.

KENTUCKY: *Examination.* Louisville, June 15-17. Sec., Dr. Bruce Underwood, 620 S. 3rd St., Louisville 2.

MAINE: Portland, March 8-9. Sec., Dr. Adam P. Leighton, 192 State Street, Portland.

MARYLAND: *Examination,* Baltimore, June 21-24. Sec., Dr. Lewis P. Gundry, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, June 14-15. Sec., Dr. John A. Evans, 612 West 40th St., Baltimore.

MASSACHUSETTS: *Examination.* Boston, March 8-11. Sec., Dr. George L. Schadt, 413 E. State House, Boston.

MINNESOTA: * Minneapolis, April 19-21. Sec., Dr. J. F. Du Bois, 230 Lowry Medical Arts Bldg., St. Paul 2.

MISSISSIPPI: Jackson, June. Asst. Sec., Dr. R. N. Whitfield, State Board of Health, Jackson.

MISSOURI: *Examination.* St. Louis, May 30-31 and June 8-10. Exec. Sec., Mr. John A. Hailey, Box 4, Jefferson City.

MONTANA: Helena, April 4-6. Sec., Dr. O. G. Klein, First National Bank Building, Helena.

NEBRASKA: * *Examination,* Omaha, June. Dir., Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Building, Lincoln 9.

NEVADA: Carson City, May 2. Sec., Dr. G. H. Ross, 112 N. Curry Street, Carson City.

NEW HAMPSHIRE: Concord, March 10-11. Sec., Board of Registration in Medicine, Dr. John S. Wheeler, 107 State House, Concord.

NEW JERSEY: *Examination.* Trenton, June 21-24. Sec., Dr. E. H Hallinger, 28 West State Street, Trenton 8.

NEW MEXICO: * Santa Fe, April 11-12. Sec., Dr. V. E. Berchtold, 141 Palace Ave., Santa Fe.

NORTH CAROLINA: *Endorsement.* Pinehurst, May 9. *Examination.* Raleigh, June 23-25. Sec., Dr. Ivan Procter, 226 Hillsboro St., Raleigh.

OHIO: *Endorsement,* Columbus, April 5. *Written.* Columbus, June. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OREGON: * *Endorsement.* Portland, April 29-30. *Examination.* Portland, July. Exec. Sec., Mr. Howard I. Bobbitt, 609 Failing Bldg., Portland.

PENNSYLVANIA: *Examination.* Philadelphia and Pittsburgh, July. Acting Sec., Mrs. B. G. Steiner, 351 Education Bldg., Harrisburg.

PUERTO RICO: *Examination.* Santurce, March 1. Sec., Mr. Luis Cueto Coll, Box 3717, Santurce.

RHODE ISLAND: * *Examination.* Providence, April 7-8. Chief, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: *Examination.* Columbia, June 27-29. *Endorsement.* Columbia, March 7, April 4, May 2, June 27-28, Aug. 1, Sept. 5 and Oct. 3. Sec., Dr. N. B. Heyward, 1329 Blanding St., Columbia.

SOUTH DAKOTA: * *Examination.* Pierre, July 19. Sec., Dr. G. J. Van Heuvelen, Capitol Bldg., Pierre.

TENNESSEE: * *Examination.* Memphis, March 23-24. Sec., Dr. H. W. Qualls, 1635 Exchange Bldg., Memphis.

TEXAS: *Examination.* Austin, June 16-18. Sec., Dr. M. H. Crabb, 209 Medical Arts Bldg., Fort Worth 2.

UTAH: *Examination,* Salt Lake City, July. Sec., Dept. of Registration, Miss Rena B. Loomis, 324 State Capitol Bldg., Salt Lake City.

VIRGINIA: *Examination.* Richmond, June 17-18. *Reciprocity.* Richmond, June 16. Dr. K. D. Graves, 631 First St., S.W., Roanoke.

WEST VIRGINIA: Charleston, April 7-9. Sec., Dr. N. H. Dyer, State Capitol, Charleston 5.

WISCONSIN: * *Examination.* Milwaukee, June 28-30. Sec., Dr. C. A. Dawson, Tremont Bldg., River Falls.

WYOMING: Cheyenne, June 6. Sec., Dr. Franklin D. Yoder, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ALASKA: Juneau, Feb. 21-26. Sec.-Treas., Dr. C. Earl Albrecht, Box 1931, Juneau.

ARIZONA: *Examination.* Tucson, March 15. Sec., Dr. Francis A. Roy, Science Hall, University of Arizona, Tucson.

ARKANSAS: *Examination.* Little Rock, May 3. Sec., Mr. L. E. Gebauer, 1002 Donaghey Bldg., Little Rock.

COLORADO: *Examination.* Denver, Mar. 2-3 and June 1-2. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver.

DISTRICT OF COLUMBIA: *Examination.* Washington, April 18-19. Sec., Dr. George C. Ruhland, 4130 Municipal Bldg., East, Washington.

FLORIDA: *Examination.* Gainesville, June 11. Sec., Mr. M. W. Emmel, University of Florida, Gainesville.

MICHIGAN: *Examination.* Detroit and Ann Arbor, May 13-14. Sec., Miss Eloise LeBeau, 101 N. Walnut St., Lansing 15.

MINNESOTA: *Examination.* April 4, June and Oct. Sec.-Treas., Dr. Raymond N. Bieter, 105 Millard Hall, Univ. of Minnesota, Minneapolis.

NEW MEXICO: *Examination.* Santa Fe, March 20. Sec., Miss Marguerite Kilkenny, 110 W. Houghton St., Santa Fe.

OKLAHOMA: April 15. Sec., Dr. Clinton Gallaher, 813 Braniff Bldg., Oklahoma City.

OREGON: Portland, March 5, June 18, Sept. 3 and Dec. 3. Sec., Mr. Charles D. Byrne, State Board of Higher Education, Eugene.

SOUTH DAKOTA: Vermillion, June 3-4. Dr. G. M. Evans, 310 E. 15th St,. Yankton.

TENNESSEE: Memphis, March 21-22 and July 8-9. Sec., Dr. O. W. Hyman, 874 Union Ave., Memphis 3.

WISCONSIN: Madison, April 2.. Milwaukee, June 4. Sec., Prof. W. H. Barber, Ripon College, Ripon.

Current Medical Literature

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Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

216:241-360 (Sept.) 1948

Effect of Oral Caronamide [Carinamide] on Plasma Penicillin Levels Following Large Intramuscular Doses of Penicillin. A. O. Seeler, H. S. Collins and M. Finland.—p. 241.
*Plasma Penicillin Levels After Oral Penicillin With and Without Oral Caronamide. H. S. Collins, A. O. Seeler and M. Finland.—p. 248.
*Poliomyelitis in Families Attacked by the Disease: I. Distribution of Virus in Stool and Oropharynx of Members in Households. H. A. Wenner and W. A. Tanner.—p. 258.
Maintenance of Patients with Tropical Sprue by Means of Massive Doses of Synthetic 5-Methyl Uracil (Thymine). G. G. Lopez, F. Milanes, R. L. Toca and others.—p. 270.
Healing of Resistant Skin Ulcers After Treatment with Nitrogen Mustard: Preliminary Note. J. Aleksandrowicz.—p. 275.
Therapy of Acute Fluoride Poisoning. J. H. Peters.—p. 278.
*One Hundred Cases of Miliary and Meningeal Tuberculosis Treated with Streptomycin. P. A. Bunn.—p. 286.
Evaluation of Thymol Turbidity Test. R. G. Ernst and L. B. Dotti. —p. 316.
Sickle Cell Trait: Incidence and Influence in Pregnant Colored Women. P. K. Switzer and H. H. Fouché.—p. 330.
Hamartomas of Lung and So-Called "Pulmonary Adenomatosis." M. A. Simon.—p. 343.
Tropical Environment and Communicable Disease. G. E. Gordon and D. L. Augustine.—p. 343.

Carinamide and Plasma Penicillin Levels.—Studies on the effect of carinamide on the blood levels obtained during oral administration of penicillin are the subject of this report by Collins and his associates. They found that penicillin when administered orally alone in doses of 100,000 units every four hours could not be relied on to maintain significant concentrations of the antibiotic in the plasma in persons under 60 years of age. Penicillin levels of 0.03 unit per cubic centimeter were usually maintained in persons over 60 years old on the same dosage. Carinamide in oral doses of 4 Gm. every four hours in persons under 60 and in doses of 3 Gm. every four hours in those over 60 enhanced and prolonged the levels from orally administered penicillin. In patients older than 60 years with slightly elevated blood nonprotein nitrogen levels the enhancing effect of carinamide persisted for at least twenty-eight hours after the carinamide was discontinued. This effect was associated with persistence of significant carinamide concentrations in the blood of these patients. The enhancing effect of carinamide on plasma penicillin levels when the penicillin is given orally seemed to be less than was the case when penicillin was given intramuscularly. The effects of carinamide during oral administration of penicillin appear to be more erratic and the individual variations are even greater than when penicillin is given intramuscularly. That age alone has an enhancing and prolonging effect on penicillin blood levels was shown in previous studies.

Distribution of Poliomyelitis Virus in Families.—Wenner and Tanner call attention to the widespread distribution of poliomyelitis virus in certain households attacked by the disease. Their studies were made on five families. Of 24 members of these families 17 (13 children and 4 adults) had poliomyelitis virus in their intestinal discharges and in 7 (5 children and 2 adults) virus was detected in the throat. On the basis of history of onset of illness and isolation of poliomyelitis virus in members of four of the five households it is suggested that virus was seeded in respective members at a common source.

Streptomycin in Miliary and Meningeal Tuberculosis.—Bunn presents the results obtained with streptomycin in 100 patients with proved acute miliary tuberculosis and/or tuberculous meningitis who were treated in the course of thirteen months in forty-seven Veterans Administration Hospitals and in five civilian hospitals. Forty of these patients are still alive between 4 and 14.3 months following the initiation of treatment. The pulmonary dissemination of miliary tuberculosis proved the most responsive to streptomycin, but a considerable number (37 per cent) of patients with tuberculous meningitis have also survived. These results are interpreted not so much as meaning that streptomycin can cure these two types of disease but rather as indicating that it is capable of influencing favorably the course of tuberculosis.

American Journal of Physiology, Baltimore

154:1-184 (July) 1948. **Partial Index**

Interrelation Between Length of Systole, Stroke Volume and Left Ventricular Work in Dog. J. W. Remington, W. F. Hamilton and R. P. Ahlquist.—p. 6.
Cholesterol and Capillary Permeability. Alene F. Silver.—p. 16.
Spectrophotometric Measurement of Traces of Dye T-1924 by Extraction with Cellophane from Both Blood Serum and Urine of Normal Dogs. T. H. Allen and P. D. Orahovats.—p. 27.
Acute Hypertension in Dogs with Cerebral Ischemia. A. C. Guyton. —p. 45.
Action Potentials in Rat Muscle with Twitch Tension Potentiated by KCl Treatment, Adrenalectomy, Tetanus and Treppe. S. M. Walker. —p. 63.
Brain Metabolism in Emotional Excitement and in Sleep. D. Richter and R. M. C. Dawson.—p. 73.
Descending Nerve Fibers Subserving Heat Maintenance Functions Coursing with Cerebrospinal Tracts Through the Pons. A. D. Keller. —p. 82.
Effect of Alloxan, Pancreatectomy and Adrenalectomy on Plasma Amino Nitrogen in Dog as Studied by Means of Hemorrhage. D. L. Kline. —p. 87.
Alloxan Diabetes in Sheep under Fasting and Non-Fasting Conditions. Esther L. McCandless, Barbara A. Woodward and J. A. Dye.—p. 94.
Comparison of Glucose Metabolism After Hemorrhage in Non-Diabetic, Alloxan Diabetic and Depancreatized Dogs. Clarissa Hager Beatty. —p. 107.
Desoxycorticosterone Acetate and Blood Pressure of Dogs on High Sodium Chloride Intake. J. E. Summers.—p. 119.
Stability of Prothrombin and Ac-Globulin in Stored Human Plasma as Influenced by Conditions of Storage. J. L. Fahey, A. G. Ware and W. H. Seegers.—p. 122.
Ability of Stomach to Produce Electrical Energy. W. S. Rehm and L. E. Hokin.—p. 148.
Salt Excretion in Desert Mammals. K. Schmidt-Nielsen, B. Schmidt-Nielsen and H. Schneiderman.—p. 163.
Buffer Equilibria and Reabsorption in Production of Urinary Acidity. W. Menaker.—p. 174.

American Journal of Tropical Medicine, Baltimore

28:629-754 (Sept.) 1948. **Partial Index**

Susceptibility of Chimpanzee to P. Malariae of Human Origin. J. Rodhain.—p. 629.
Isospora Hominis Infections Among American Personnel in Southwest Pacific. W. L. Barksdale and C. F. Routh.—p. 639.
Biologic Studies on Miracidium of Schistosoma Mansoni. J. F. Maldonado and Josefina Acosta-Matienzo.—p. 645.
*Effect of Para-Aminobenzoic Acid upon Clinical Course, Rickettsemia, and Development of Complement-Fixing Antibodies of Murine Typhus in Guinea Pig. J. F. Sadusk Jr., Constance Hjerpe and Mildred Freedman.—p. 673.
Cross-Immune Reactions Between Panamanian Strains of Q Fever and Endemic Typhus. E. C. de Rodaniche.—p. 683.
Biologic Properties of Strain of Toxoplasma Recovered from Fatal Case of Congenital Toxoplasmosis. I. Ruchman and R. J. Johansmann.—p. 687.
Tropical Rat Mite, Liponyssus Bacoti, as Experimental Vector of Rickettsialpox. C. B. Philip and L. E. Hughes.—p. 697.
Coccidioidomycosis Salivary Gland of Townsend Mole. L. E. Rector and Eleanor J. Rector.—p. 707.
Residual Effectiveness of DDT in Third Season After Application. W. G. Downs, R. Colorado Iris and J. B. Gahan.—p. 741.

Para-Aminobenzoic Acid and Murine Typhus.—Sadusk and his associates believe that the mechanism of action of para-aminobenzoic acid is primarily rickettsiostatic. They found that administration of para-aminobenzoic acid in adequate dosage to guinea pigs infected with murine typhus generally prevents the development of fever and scrotal reaction but permits the appearance of rickettsias in the circulating blood and the formation of complement-fixing antibodies. This rickettsemia appears in the treated animals at the same time as that observed in untreated infected animals. Complement-fixing antibodies also appear at the same time in both groups of animals, and the rise in titer likewise is about the same. Despite the fact that animals treated with para-aminobenzoic acid may exhibit no signs of clinical infection, such animals are immune to subsequent challenge with murine typhus rickettsias.

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American Review of Tuberculosis, New York

58:255-374 (Sept.) 1948

*Protective Vaccination Against Tuberculosis with Special Reference to BCG Vaccination. J. D. Aronson.—p. 255.
Recurrence of Coccidioidal Cavities Following Lobectomy for Bleeding Focus. D. Krapin and F. J. Lovelock.—p. 282.
Thoracoplasty Without Apicolysis. C. Domokos.—p. 291.
Four Rib Apicoplasty with Placing the Scapula into Thorax. C. Domokos.—p. 297.
Prognostic Significance of Occasionally Positive Sputum After Adequate Treatment of Tuberculosis: Follow-Up Study of Discharged Patients. R. Chang.—p. 303.
Significance of Positive Cultures in Apparently Adequately Treated Patients with Pulmonary Tuberculosis. H. Abeles.—p. 308.
*Public Health Significance of Rare Tubercle Bacilli in Sputum. F. M. Pottenger.—p. 314.
Closure and Healing of Tuberculous Cavities. J. Loesch.—p. 322.
Drug-Resistant Tubercle Bacilli in Patients Under Treatment with Streptomycin. E. Wolinsky, A. Reginster and W. Steenken Jr.—p. 335.
*Streptomycin Resistant Tubercle Bacilli: Incidence in Patients Treated with Streptomycin. S. Bernstein, N. D. D'Esopo and W. Steenken Jr.—p. 344.
Streptomycin in Experimental Tuberculosis: II. Response in Guinea Pigs Infected with Strains of Varying Degrees of Streptomycin Resistance. W. Steenken Jr. and E. Wolinsky.—p. 353.
Study of Certain Problems in Use of Standard Tuberculin. Fractionation of PPD, Standardization of Tuberculins, and Question of Sensitization. Florence B. Seibert and Emma Dufour.—p. 363.

Vaccination Against Tuberculosis.—According to Aronson BCG vaccine was administered intracutaneously to 1,551 American Indians ranging in age from less than 1 year to 20 years and to 123 newborn infants. At the same time 1,457 Indians of comparable age and living under the same conditions received an intracutaneous injection of sterile isotonic sodium chloride solution and served as controls. One hundred and thirty-nine newborn infants also served as controls. The vaccinated persons and controls were followed over nine to eleven years by means of tuberculin tests and roentgenograms of the chest, while the group of "newborn" infants was similarly followed for six to eight years. Among the 1,551 persons vaccinated with BCG there occurred a total of 55 deaths, including 6 deaths from tuberculosis. Among the 1,457 controls there occurred a total of 109 deaths, including 53 deaths from tuberculosis. Among the 123 newborn infants who were vaccinated 7 have died, none from tuberculosis. Among the 139 newborn controls, 15 have died, 4 of them from tuberculosis. The tuberculin reaction became positive one year after vaccination in 93.3 per cent of cases and has remained at approximately the same level throughout the course of study. Among the controls the tuberculin reaction became positive in 12.7 per cent within one year after the initial negative reaction, and there has been a constant and gradual increase in the percentage of the controls reacting to tuberculin. Roentgenologically demonstrable lesions having the characteristics of primary tuberculosis occurred in 22 of the vaccinated and in 120 of the controls. Minimal lesions of reinfection type, progressive lesions and miliary and extrapulmonary lesions of tuberculosis were found in 21 of the vaccinated and in 93 of the controls.

Rare Tubercle Bacilli in Sputum.—Pottenger says that at his sanatorium the dilution-flotation-picric-acid technic has been employed for the examination of sputum. By examination of three day specimens every six weeks it has not been possible to demonstrate an absence of bacilli for three consecutive examinations in more than 4 or 5 per cent of the patients at the time of discharge from the sanatorium. In contrast, many institutions report sputum conversion in 50 per cent or more. The author raises the question: "How dangerous is sputum which contains a few hundred or a few thousand bacilli in a twenty-four-hour quantity?" The "rare bacillus" stage of tuberculosis, with the discharge of a few hundred or a few thousand bacilli per day, is compared with the acute stage in which millions and even billions of bacilli are discharged per day. There is a question whether patients with chronic destructive lesions would even become continuously and permanently free from the discharge of bacilli, if technics for examination were sufficiently sensitive, even though the patients might be clinically well and able to carry on their regular work. As about two thirds of clinical patients give no history of association with "open" tuberculosis, the importance of susceptibility is compared with that of environment in causing illness. The author stresses the importance of reducing susceptibility through both vaccination and improvement in environment.

Streptomycin-Resistant Tubercle Bacilli.—Bernstein and his co-workers treated 45 patients who had pulmonary tuberculosis with 1 Gm. of streptomycin daily, divided in five or six equal doses, for a period of one hundred and twenty days. Tubercle bacilli isolated prior to therapy from all 45 patients were sensitive to 1.0 microgram or less of streptomycin per cubic centimeter of medium. After one hundred and twenty days of treatment with streptomycin, tubercle bacilli were recovered from the sputum or gastric contents of 31 of the 45 patients. Tubercle bacilli resistant to 10 or more micrograms of streptomycin per cubic centimeter were recovered from 26 of the 31 patients. Eighteen strains were capable of growth in over 1,000 micrograms of streptomycin per cubic centimeter of medium. The rate of development of streptomycin-resistant tubercle bacilli was greatest during the second month of therapy.

Archives of Internal Medicine, Chicago

81:431-604 (April) 1948

*Temporal Arteritis: Review of Literature and Report of 5 Additional Cases. R. C. Crosby and R. C. Wadsworth.—p. 431.
Thrombosis of Inferior Vena Cava Due to Hypernephroma. M. M. Fisher and N. D. Ritz.—p. 465.
Pneumonia Associated with Acute Salmonellosis: Report of Case of Salmonella Bronchopneumonia and 14 Cases of Interstitial Pneumon. A. P. Ingegno, J. B. D'Albora, J. N. Edson and P. J. Gianquinto.—p. 476.
Cytochrome C Therapy of Tissue Anoxia in Case of Hepatolenticular Degeneration. S. Zelman and T. Gilbert.—p. 485.
*Disregarded Seedbed of Tubercle Bacillus. E. M. Medlar, D. M. Spain and R. W. Holliday.—p. 501.
Apical Systolic Murmur. A. M. Master.—p. 518.
Gastroenterology: Review of Literature from July 1946 to July 1947. J. B. Kirsner, W. L. Palmer, W. E. Ricketts and others.—p. 534.

Temporal Arteritis.—Crosby and Wadsworth believe that benign arteritis and periarteritis of the temporal arteries are not as uncommon as the paucity of reported cases would indicate. The 2 cases here reported have been seen at the Eastern Maine General Hospital within a six month period. Three additional cases seen at the Joseph H. Pratt Diagnostic Hospital in Boston are briefly reported. This brings the total of reported cases to 48. The essential data of previously reported cases are analyzed. The pathologic changes in biopsy specimens of artery segments of 1 of the reported cases are described in detail. A dissecting aneurysm of one temporal artery and phlebitis of the accompanying veins were found. From the analysis and study of the clinical and pathologic data of all the reported cases it is apparent that temporal arteritis is a distinct clinical entity affecting persons of the older age group and characterized by local symptoms consisting of painful, tender, red, swollen, nodular and thrombosed temporal arteries with edema and pain in the adjacent structures and systemic symptoms consisting of fever, malaise, anorexia, loss of weight and weakness. The edema of the overlying skin is probably contributed to by phlebitis of the accompanying vein. Blindness is relatively common in this disease and was found in one or both eyes in 33.3 per cent of the cases. The possible prophylactic value of section of the middle temporal artery early in the disease is suggested. The local symptoms can be explained on the basis of inflammation of the temporal vessels and their branches. The systemic symptoms probably indicate a more generalized arteritis. The mortality of this disease, 12.5 per cent, is considerably less than that of most other forms of arteritis.

Seedbed of Tubercle Bacillus.—Medlar and his co-workers point out that the steady decline in the mortality from tuberculosis has been interpreted as indicating that this disease would in the near future become one of minor significance. This implies that there is a definite ratio between new cases of tuberculosis and deaths from the disease. Studies indicate, however, that the mortality rate and the annual incidence rate are independent. The present study was undertaken to determine the unknown source of infection, the "seedbed" of the tubercle bacillus. The authors found that among patients who

died from tuberculosis the clinical diagnosis was incorrect six times more often for persons over 50 than for persons under 30 years. Among patients who died from other diseases, but who harbored tuberculosis which was capable of spreading, there was clinical recognition of tuberculosis in only one fourth. Older persons can have progressive disease with so few manifestations of illness that they may remain unrecognized spreaders of the infection. The registration of death from tuberculosis in New York City appears to be below the actual with respect to persons over 50 years of age. In a high proportion of new cases of tuberculosis the disease is apparently contracted from unrecognized sources of infection. Mortality rates, encouraging as they seem, do not indicate either the extent or the location of the seedbed in which the tubercle bacillus resides. The seedbed must be controlled if the continuity of the disease is to be broken.

Journal of Pediatrics, St. Louis

33:401-524 (Oct.) 1948

The Hemodynamogram: Fetal, Normal, and Abnormal Blood Circulation Depicted by New Method. H. W. Bischoff, F. R. Leyva and E. C. Rice.—p. 401.
Truncus Arteriosus Communis Persistens: Report of 3 Cases. H. W. Bischoff, F. R. Leyva, R. H. Todd and E. C. Rice.—p. 411.
*Transfusions in Newborn Infants Through Abdominal Wall Segment of Umbilical Vein. L. R. Pinkus.—p. 418.
Methemoglobinemia in Young Infants. M. Cornblath and Alexis F. Hartmann.—p. 421.
Significance of Positive Blood Cultures in Newborn Infants. W. W. Waddell Jr. and W. Grossmann.—p. 426.
Socio-Emotional Factors Accounting for Growth Failure in Children Living in an Institution. R. Fried and M. F. Mayer.—p. 444.
Food Allergy: Death in Six-Day-Old Infant. C. B. Kelvin and R. A. Schless.—p. 457.
Erythrocyte Sedimentation Rate Determinations in Poliomyelitis and Other Infections of Central Nervous System and Meninges. T. L. Hartman and L. Weinstein.—p. 462.
Preliminary Report on Rheumatic Fever in Virginia. Carolyn M. McCue and Louise F. Galvin.—p. 467.

Transfusion in Newborn Infants.—Recent literature contains reports on giving transfusions to the newborn infant via the umbilical vein within the umbilical cord. The applicability of the method is limited by the brief period during which the umbilical vein remains patent within the rapidly atrophying cord. Estimates of this period vary between twelve and forty-eight hours. Pinkus utilized that portion of the umbilical vein which lies within the abdominal wall. Here the vein is readily available even after atrophy of the umbilical cord. A transverse incision is made cephalad to the upper margin of abdominal insertion of the umbilical cord. The umbilical vein is visualized as a whitish, longitudinal, tubular structure elevating the thin midline aponeurosis. A 0.5 cm. longitudinal incision through the aponeurosis is made on either side of the vein. After loose application of a fine silk or a surgical gut ligature around the upper exposed portion of the vein, a transverse nick is made through its anterior wall. A cannula is then introduced cephalad until blood can be aspirated. The ligature is then tied with a single hitch to effect snug approximation of the vein wall around the indwelling cannula, and transfusion is carried out. On termination of transfusion, the cannula is withdrawn, and the ligature is tightened and completed with a second hitch. Skin edges are approximated with two silk sutures. The length of time after birth during which this technic is applicable is as yet undetermined, but its usefulness far outlasts the approach via the cord.

Pennsylvania Medical Journal, Harrisburg

52:1-88 (Oct.) 1948

Presidential Address. G. C. Engel.—p. 25.
Treatment of Epilepsy. M. T. Moore.—p. 31.
*Rheumatoid Arthritis: 475 Cases Treated with 721 Courses of Gold. A. Cohen, A. W. Dubbs and J. Goldman.—p. 35.
Ragweed Extermination Plan for Philadelphia: Results of First Year's Survey. G. I. Blumstein, J. Spiegelman and V. Hirsch.—p. 39.
Cancer Situation in Pennsylvania. L. D. Bristol.—p. 45.

Gold in Rheumatoid Arthritis.—Cohen and his associates gave seven hundred and twenty-one courses of gold therapy in 475 patients with rheumatoid arthritis. The same gold preparation was used in all cases. In the earlier cases a course of gold therapy consisted of intramuscular injections of 10 mg. twice weekly, four doses; 25 mg. twice weekly, four doses; 50 mg. twice weekly, four doses, and 100 mg. weekly, nine doses—a total of 1,240 mg. At present the course consists of 10 mg. twice weekly, four doses, and 25 mg. twice weekly, four doses; if improvement is shown at this point, the dosage is not increased, and 25 mg. is given weekly until a total of 790 mg. is administered; but if there is no improvement, 50 mg. is given twice weekly, four doses, 50 mg. weekly, nine doses—a total of 790 mg. The 100 mg. dose has been discarded entirely. This tendency toward lower dosage has increased the safety of gold therapy. Gold therapy resulted in definite objective improvement in 64 per cent. Toxic reactions were encountered in 15 per cent of the courses, 21 per cent of the patients. The authors conclude that gold therapy may be employed in rheumatoid arthritis with safety if conservative dosage is used, if vigilance against incipient toxic reactions is maintained, and if treatment is stopped and the antidote BAL is employed immediately on appearance of the first toxic symptoms.

Plastic & Reconstructive Surgery, Baltimore

3:517-632 (Sept.) 1948. **Partial Index**

Nasal Deformities of Syphilitic Origin. V. H. Kazanjian.—p. 517.
*Wet Dressings in Plastic Surgery. W. S. Kiskadden and A. J. McDowell.—p. 524.
*Reconstruction of Thumb by Transposition of Adjacent Digit. R. C. Tanzer and J. W. Littler.—p. 533.
*Reconstruction of Fingers. G. Nieto Cano.—p. 548.
Plexiglass Splints: Their Use in Pedicle Flap Attachments. G. S. Letterman.—p. 553.
Reduction of Massive Breast Hypertrophy. H. O. Bames.—p. 560.
Mandibular Bone Grafts. W. B. Macomber, R. A. Shepard and V. E. Crofut.—p. 570.
Polyethelene in Reconstructive Surgery. L. R. Rubin, G. W. Robertson and R. N. Shapiro.—p. 586.
Reconstruction of Nasal Tip: New Technic. R. C. Seeley.—p. 594.

Wet Dressings in Plastic Surgery.—Kiskadden and McDowell first cover the graft with only one or two single layers of gauze. Irrigating catheters, which may be old no. 16 to no. 20 urethral catheters with extra holes cut in them, are spaced about 2 to 3 inches (5.1 to 7.6 cm.) apart. They are then covered with several layers of moistened gauze sponges and one or two layers of abdominal pads or mechanic's waste. This dressing is then tied snugly in place over the graft by means of heavy silk sutures placed in the skin margins about the periphery of the wound. This dressing is then supplemented with an outer dressing of abdominal pads or mechanic's waste. The use of cellophane, oiled silk, rubber sheeting or other impervious materials is avoided, since it appears to promote the growth of pyocyanic and other infection. The success of the dressing depends on keeping it constantly and thoroughly saturated. Three ounces (90 cc.) of solution injected into each catheter every two hours day and night usually will be adequate. Old third degree burns that when first seen are grossly infected from prolonged improper care can often be grafted within three or four days with no other preparation than the application of wet dressings and correction of existing anemia with blood transfusions. This program presupposes the complete excision of the granulating surfaces and scar base down to normal tissue at the time of operation and the application of relatively thick grafts. Continuing the wet dressing for seven to ten days postoperatively results in a complete take of the grafts.

Reconstruction of Thumb.—According to Tanzer and Littler a satisfactory reconstruction of the thumb should meet three criteria: (1) sufficient forceful flexion and extension to permit grasping, (2) opposability of the tip of the reconstructed thumb to the pulp of at least one digit and (3) tactile sensation at its tip. The authors describe a method for the reconstruction of subtotal or total loss of the thumb, which meets these requirements. They present 7 cases in which this method was used. In most cases the transposition of an adjacent digit to thumb position requires the use of a pedicle flap to close the intervening defect. It is preferable to perform the transposition and the bony fusion in separate stages in order to obtain a more accurate positioning of the reconstructed thumb. Following fusion, further revision in the nature of

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tendon transfers and grafts or shortening of the tip is frequently necessary. A damaged digit can often be more effectively employed in reconstructing a thumb than in attempting to restore its useful function as a finger.

Reconstruction of Fingers.—Nieto Cano reports the case of a factory worker, aged 21, all 5 fingers of whose right hand had been smashed. Surgical cleansing of the wound left the first and fifth fingers without skin over part of the last phalanges and the second, third and fourth fingers with only the proximal extremities of the first row of phalanges. The author took a piece of bone off the crest of the ilium in order to build up the skeleton of the three phalanges. The piece of bone so obtained has both compact and cancellous tissue. Over the sternum, the author made a Gillies tubed pedicled flap in order to cover the first phalanx of the middle finger and the artificial extremity of the same. He also made pockets under the skin for the second and fourth fingers. Skin grafts were made over the exposed areas of the first and fifth fingers. Except for the loss of the bone graft applied to the index finger the results were as intended.

Proc. of Staff Meet. of Mayo Clinic, Rochester, Minn.

23:449-464 (Sept. 29) 1948

Role of Alkaline Phosphatase in Osteogenesis After Transplantation of Bone. A. M. McKelvie and F. C. Mann.—p. 449.
*Significance of Ulcerating Lesion in Stomach After Gastro-Enterostomy. H. K. Gray and K. A. Lofgren.—p. 454.

Ulcerating Gastric Lesions After Gastroenterostomy.—Gray and Lofgren reviewed the records of 825 consecutive patients seen at the Mayo Clinic during the ten year period from 1938 to 1947 inclusive, for those in whom a previously made gastroenteric stoma for duodenal or gastric ulcer had to be taken down owing to subsequent complications and for whom partial gastrectomy was performed as a secondary procedure. These subsequent complications for which surgical intervention was advised included jejunal ulceration near the gastroenteric stoma, malfunctioning gastroenteric stoma, gastric ulcer and gastric carcinoma, in descending order of relative occurrence. There were 41 gastric lesions that developed after gastroenterostomy for duodenal ulcer, of which 11 were gastric carcinomas and 30 were benign gastric ulcers. There also were 11 gastric lesions that developed or were retained after gastroenterostomy for gastric ulcer, of which 6 proved to be malignant and 5 proved to be benign gastric ulcer at the time of the subsequent gastric resection. Included in this study was 1 patient whose history showed that he had undergone gastroenterostomy for no demonstrable ulcer and in whom there developed a gastric carcinoma that required surgical intervention several years later. This review proves that lesions that develop in the stomach after gastroenterostomy has been performed have a high incidence of malignancy. Of the 53 patients in whom gastric lesions developed that required secondary gastrectomy, 18 had gastric carcinomas. The true nature of a lesion in a stomach on which gastroenterostomy has been performed is often difficult to determine clinically. The symptoms and clinical findings may give the impression of a benign lesion when the underlying condition is malignant.

Psychiatry, Washington, D. C.

11:223-324 (Aug.) 1948. **Partial Index**

Notes on Development of Treatment of Schizophrenics by Psychoanalytic Psychotherapy. Frieda Fromm-Reichmann.—p. 263.
American Character as Revealed by the Military: Descriptions and Origins. G. D. Spindler.—p. 275.
Oedipus Myth in History and Psychiatry: New Interpretation. A. J. Levin.—p. 285.
Observations Concerning Typical Anxiety Dreams. I. Harris.—p. 301.

Psychoanalytic Quarterly, Albany, N. Y.

17:303-434 (July) 1948. **Partial Index**

Concept of Transference. W. V. Silverberg.—p. 303.
Further Contribution to Study of Olfactory Repression with Particular Reference to Transvestitism. G. W. Wilson.—p. 322.
Ego Functioning in Two Types of Dreams. M. L. Miller.—p. 346.
Mannerisms of Speech: A Contribution to Working Through Process. S. S. Feldman.—p. 356.
Comments on Psychoanalytic Theory of Instinctual Drives. H. Hartmann.—p. 368.

Public Health Reports, Washington, D. C.

63:1247-1282 (Sept. 24) 1948

Statistical Studies of Heart Diseases: II. Important Factors in Heart Disease Mortality Trends. T. D. Woolsey and I. M. Moriyama.—p. 1247.

63:1283-1318 (Oct. 1) 1948

Preliminary Report on Community-Wide Chest X-Ray Survey at Minneapolis, Minnesota. W. Roemmich, Francis J. Weber, F. J. Hill and Lucille Amos.—p. 1285.
Depression of Tuberculin and Histoplasmin Sensitivity Associated with Critical Illness. M. L. Furcolow, Mabel E. Emge and I. L. Bunnell.—p. 1290.
Variations in Histoplasmin Sensitivity in Certain Cities in Eastern Kansas. I. L. Bunnell and M. L. Furcolow.—p. 1298.
Effect of Different Methods of Coagulation of Culture Media on Tubercle Bacilli Growth. M. M. Cummings, Margaret C. Drummond and G. T. Lewis.—p. 1305.

63:1319-1349 (Oct. 8) 1948

Diarrheal Disease Control Studies: I. Effect of Fly Control in High Morbidity. J. Watt and D. R. Lindsay.—p. 1319.
*Is Diabetes Mortality Increasing? I. M. Moriyama.—p. 1334.

Is Mortality Due to Diabetes Increasing?—Moriyama shows that the official mortality statistics for the United States give no indication of the decline in diabetes mortality which was expected after the discovery of insulin in 1922. On the contrary, the recorded crude death rate for diabetes has continued to rise. Data are presented which suggest that since the introduction of insulin the "true" diabetes mortality trend has been downward rather than upward. The author believes that this discrepancy can be explained by the fact that in the present method of selecting the primary cause of death, cognizance is not taken of the distinction made in the physician's statement that a particular cause was not related to the immediate or underlying cause of death but might have contributed to the risk of dying. In the case of diabetes this frequently results in primary cause assignments that cannot be justified on a medical basis. For example, a physician in attendance on a diabetic patient with heart disease may feel that the diabetes was a contributory factor to the risk of dying even though diabetes was under insulin control. In such a case, he would report the heart disease as the underlying cause of death and the diabetes as a contributory cause. In the cause of death classification, however, diabetes would be selected as the primary cause over heart disease. The author is convinced that unless the cause of death coding practice is modified in regard to diabetes, death statistics will continue to be a misleading index of the mortality risk from diabetes.

Rhode Island Medical Journal, Providence

31:533-588 (Sept.) 1948

Vesicovaginal Fistulae and Their Surgical Treatment. L. E. Phaneuf.—p. 547.
Modern Health Programs. E. A. McLaughlin.—p. 550.
Acute Ascending Paralysis: Case Report of Repeated Attacks with Complete Recovery. W. C. Weigner.—p. 556.
The Doctor's Role in Community Programs. H. R. Leavell.—p. 562.
Medical Statistics in Hospitals. Mary Nunez.—p. 580.

31:589-648 (Oct.) 1948

Effective Procedures in Treatment of Injured Hands to Prevent Crippling Deformities. W. E. Browne.—p. 603.
Pneumonia Not Responding to Penicillin. M. Cutts.—p. 609.

Rocky Mountain Medical Journal, Denver

45:729-816 (Sept.) 1948

The Acute Abdomen. P. Thorek.—p. 748.
Preventive Pediatrics—Behavior Aspects. L. F. Hill.—p. 755.
Kala-Azar. C. M. Mazey and R. J. McGregor.—p. 762.
Distribution of Physicians and Physicians' Services in Colorado, 1948: I. Specialization. H. J. Dodge, M. M. Clapper and W. Darley.—p. 765.
One Answer to Small Rural Hospital Units. R. B. Patterson.—p. 771.

45:817-904 (Oct.) 1948

Presidential Address. C. F. Hegner.—p. 836.
Political Influence of Medical Profession. D. H. Murray.—p. 842.
Renal Tumors. L. M. Arthur.—p. 849.
Group Practice and Health Insurance. S. S. Kauvax.—p. 854.
Obstetric Hemorrhage. E. S. Taylor and W. C. Pallas.—p. 856.

Southern Medical Journal, Birmingham, Ala.

41:861-964 (Oct.) 1948. **Partial Index**

Vaginal Cytology of Postmenopausal Women: Study I. Cytologic Variations in Vaginal Smears. J. R. Kernodle and W. K. Cuyler.—p. 861.
Penicillin Instillation in Bronchiectasis. N. F. Thiberge.—p. 873.
Some Experiences in Use of Cutis Graft in Surgery: Case Reports. J. E. Cannaday.—p. 876.
Surgical Repair of Incontinent Anal Canal. C. Rosser.—p. 882.
Surgical Treatment of Chronic Ulcerative Colitis. G. W. Ault.—p. 884.
Intraperitoneal Injury of Hollow Viscus Due to Nonpenetrating Wounds. C. A. Reifschneider and E. R. Jennings.—p. 888.
Radical Panhysterectomy (Wertheim) and Radical Pelvic Lymphadenectomy: Preliminary Report of 75 Operations. W. L. Thomas, B. Carter and R. T. Parker.—p. 895.
Retreatment of Carcinoma of Cervix. L. A. Calkins.—p. 902.
Experiences with Wertheim Hysterectomy in Oklahoma City. J. W. Kelso.—p. 906.
Treatment of Cervical Cancer in Local Tumor Clinics. W. B. Harrell and E. T. Ellison.—p. 909.
Blue Cross Plan and Medical Teaching Program. M. H. Coleman Jr. —p. 912.
Urinary Tract as Obstetrical Problem. W. A. Ruch.—p. 916.
Treatment of Eclampsia by Means of Regional Nerve Block. F. E. Whitacre, R. A. Hingson and H. B. Turner.—p. 920.
Primary Splenic Neutropenia. M. S. Sacks and T. N. Carey.—p. 922.
Treatment of Intertriginous Moniliasis. E. R. Seale and W. A. Clark. —p. 926.
Inhalant Sensitizations in Allergic Headaches. H. D. Ogden.—p. 931.

Surgery, St. Louis

24:593-754 (Oct.) 1948

*Etiology of Acute Pancreatitis: Experimental Study. R. Lium and S. Maddock.—p. 593.
Combined Abdominothoracic Incision Particularly Adapted for Use in Total Gastrectomy and Esophagogastrectomy. A. J. Kremen.—p. 605.
Gastric Resection: Schoemaker-Billroth I Operation. J. F. Higginson and O. T. Clagett.—p. 615.
Suction and Feeding Tube for Postoperative Case of Gastric Resections. L. Singmaster.—p. 621.
Diaphragmatic Hernia Following Subdiaphragmatic Vagotomy: Case Report. J. M. Beal.—p. 625.
Role of Pleural Exudation in Infection Following Pneumonectomy: Experimental Study. J. T. Small and G. M. Higgins.—p. 628.
*Effect of Streptomycin, Local and Systemic, on Contaminated, Sutured Wounds. C. K. Kirby, J. A. Dull, H. E. Fulton and others.—p. 647.
Method for Puncturing Blood Vessels, Located and Exposed by Incision. H. Lamm.—p. 653.
Some Technical Considerations in Arteriographic Examination of Lower Extremity. R. G. Smith and D. A. Campbell.—p. 655.
Value Derived from Utilizing Component Parts of Transversalis Fascia and Cooper's Ligament in Repair of Large Indirect and Direct Inguinal Hernia: Group of Cases. D. C. Donald.—p. 662.
Definitive Ambulatory Treatment for Infected Pilonidal Cysts. G. Crile Jr. —p. 677.
Ischial Decubitus Ulcer. E. Bors and A. E. Comarr.—p. 680.
Histology of Surgically Removed Sympathetic Ganglia. L. L. Bergmann, P. J. Harman, J. Pick and H. M. Wertheim.—p. 695.
Internal Fixation of Hip Fractures with New Lag Screw. J. S. Lundholm.—p. 703.
Epidermoid Cyst of Spleen. E. F. Parker and A. G. Brown.—p. 708.
Sciatica Caused by Cyst Formation in Old Hematoma: Report on 3 Patients Treated Surgically. R. Herz.—p. 714.
Amputation of Canine Atrial Appendages. H. K. Hellerstein, E. Sinaiko and M. Dolgin.—p. 719.
Treatment of Malignant Lip Furuncles with Emetine. E. Melchior. —p. 724.

Causation of Acute Pancreatitis.—Lium and Maddock believe that two factors are responsible for most cases of pancreatitis, (1) obstruction of the pancreatic ducts in the presence of a (2) secreting or stimulated gland. In the experiments described in this paper it was the object first to obstruct the pancreatic ducts and then to stimulate the gland by various means. Stimulation of the pancreas has been produced by (1) feeding, (2) acetylcholine and physostigmine, (3) pilocarpine, (4) stimulation of the vagus and (5) secretin. In a high percentage of these experiments, combining obstruction of the pancreatic ducts and stimulation of the gland, acute inflammation of the pancreas and fat necrosis resulted. The most extensive and consistent damage resulted when the animals were fed two hours before ligation of the pancreatic ducts. The authors discuss the different mechanisms that can produce obstruction of pancreatic secretion. They correlate the clinical and experimental evidence to explain the varying degree of acute pancreatitis seen at operation or necropsy.

Streptomycin in Contaminated, Sutured Wounds.—Kirby and his associates say that streptomycin, with fewer limitations than the sulfonamide compounds and penicillin, appears to be a more suitable agent for application to wounds. It has a wide antibacterial range, being effective against both gram-positive and gram-negative organisms. It acts rapidly in the presence of blood and pus and is relatively nontoxic. In the experiments herein reported, sutured wounds produced in dogs have been inoculated with a standard dose of gram-positive and gram-negative organisms, a method resulting in 100 per cent wound infection and 53 per cent mortality in control animals. Prophylactic systemic (intramuscular) administration of streptomycin was effective in controlling the infection, as evidenced by a reduction in mortality, toxicity and septicemia. A single local application of 50,000 units of streptomycin in an ointment base appeared to be as effective as intermittent intramuscular administration for six days. This was true both when the streptomycin was applied locally at the time of inoculation with the organisms and when applied eight hours later after multiplication and invasion of the bacteria had begun. The occurrence of streptomycin-resistant organisms in many human traumatic wounds would be expected to limit the clinical effectiveness of streptomycin in the ointment base used in these experiments. In addition, the ointment base causes separation of the wound edges and acts, to some extent, as a foreign body.

Texas State Journal of Medicine, Fort Worth

44:345-412 (Sept.) 1948

Clinical Value and Limitations of Electroencephalography. M. L. Towler. —p. 349.
Salicylate Intoxication: Report of Case. Lynn A. Bernard and E. A. Wilkerson.—p. 354
Advances in Infant Nutrition. J. P. Gibson.—p. 358.
Use of Gamma Globulin in Pediatrics: Clinical Observation. J. T. Frawley.—p. 361.
Lymphocytic Choriomeningitis: Clinical, Epidemiologic, and Laboratory Aspects. F. Brooksaler and S. E. Sulkin.—p. 364.
Pathologic Conditions of Nasopharynx: Diagnosis and Treatment. H. H. Harris.—p. 368.
Thrombophlebitis of Cavernous Sinus with Recovery. J. A. Stool and R. D. Lomas.—p. 372.
Management of Parotid Lesions. C. C. Cody III.—p. 374.
*Management of Chronic Suppurative Tympanomastoiditis. L. M. Sellers. —p. 378.
Role of Calcium in Bone Disorders. J. J. Hinchey.—p. 382.
*Chronic Inflammatory Lesions of Bone Resembling Neoplasms: Report of 3 Cases. L. W. Breck, W. C. Basom, M. S. Hart and J. R. Herz. —p. 386.
*Studies in Laboratory Diagnosis of Chancroid Disease: Preliminary Report. D. M. Kuhns, R. I. Anderson, Marjorie A. Henke and D. G. Wetherbee.—p. 389.
Tularemia: Some Clinical and Pathologic Observations. R. H. Rigdon. —p. 392.
Texas Public Health Training Unit. B. M. Primer.—p. 397.
Surgical Treatment of Intertrochanteric Fractures of Femur. F. C. Hodges.—p. 400.

Chronic Suppurative Tympanomastoiditis.—Sellers points out that chemotherapy and biotherapy have reduced to almost zero the incidence of acute suppurative mastoiditis. Various bacterial forms develop an immunity to these therapeutic agents when the agents are used in insufficient dosages and over insufficient periods. When immunity of the bacteria occurs in acute otitis media, the infection will become latent, the pathologic process will continue at a reduced pace, and chronic tympanomastoiditis will develop. Cases of chronic tympanomastoiditis usually stem from acute suppurative otitis media rather than from acute suppurative mastoiditis. As a result of the attempted arrest and repair, varying portions of the tympanum, attic and antrum, and usually a greater or lesser portion of the mastoid are involved in varying degrees. For this reason treatment must be determined by the distribution and type of lesion. Here lies the difference between acute suppurative otitis media and mastoiditis on the one hand and chronic suppurative tympanomastoiditis on the other. In acute suppurative mastoiditis (if no complications exist) the problem is the same in every case. It is the elimination of an acute suppurating focus. Each case of chronic tympanomastoiditis presents a problem of its own. The treatment of tympanomastoiditis is not necessarily surgical; under certain conditions medical treatment may be sufficient. Surgery should be advised and even urged when any of the following factors are present: (1) an active process in the mastoid, (2) an incarcerated cholesteatoma, (3) evidence of progressive necrosis in the tympanum or attic, (4) evidence of

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the extension of the process to the internal ear, the facial nerve or the intracranial cavity and (5) evidence of increased sepsis. The author stresses that because in the future chronic tympanomastoiditis will be the infectious disease of the temporal bone most frequently encountered, ability to perform the total or modified tympanomastoidectomy must be brought to its best technical development. In the author's hands the endaural approach has proved to be the more satisfactory.

Inflammatory Lesions of Bone Resembling Neoplasms.—Breck and his co-workers say that sometimes it is astounding how much an inflammatory lesion can resemble a bone tumor. They report 3 cases in which the differentiation was impossible clinically and roentgenologically. In 2 of these cases a tumor was believed to be the most likely diagnosis and an inflammatory process was considered in the differential diagnosis. In the third case a neoplasm was the only diagnosis seriously considered. One of these cases looked much like Ewing's tumor of the shaft of the tibia; the second case looked like an osteogenic sarcoma of the shaft of the metatarsal bone; the third case resembled an osteogenic sarcoma of the end of the fibula in a child. The differential diagnostic points in these cases are brought out by the case histories and discussion. The authors stress the importance of making a careful biopsy before instituting radical treatment in a case of suspected cancer of the bone.

Laboratory Diagnosis of Chancroid Disease.—Kuhns and his co-workers show that hitherto the diagnosis of chancroid was usually made by a process of exclusion, which consisted of repeated dark field examinations for spirochetes. If results were negative, diagnosis of chancroid or lymphogranuloma venereum was made, based on clinical manifestation. Chancroid disease was a considerable problem in the occupational troops in the Philippines. A study of contacts reported by Trussell of the Medical Laboratory in Manila indicated that many of the women demonstrated chancroid lesions which were negative for spirochetes on dark field examination; findings on direct smear were typical of Hemophilus ducreyi. Other investigators confirmed the role of H. ducreyi. Various mediums have been used for the culture of the organisms from chancroid lesions. At the laboratory with which the authors are connected it was found that tissue impressions on glass slides properly made and stained from chancroid ulcers consistently demonstrated morphologically characteristic H. ducreyi organisms. Of 40 penile ulcers suspected to be chancroid, 21 were found positive by direct smear; in 34 of the 40 cases cultures were made, and 14 of these were positive for chancroid. It is their experience that the impression smear and culture are reliable. The method of preparation of the lesion for making the smear is essential for success in making a good impression slide and for obtaining cultures of the organism. The authors confirm the value of the tryptose phosphate agar medium. An apparent mutation form of H. ducreyi, hitherto undescribed, has been reported.

Virginia Medical Monthly, Richmond

75:491-546 (Oct.) 1948

Advantage of Indirect Skin Tests for Young Allergic Children. W. A. McGee.—p. 491.
Gout Simulating Rheumatoid Arthritis. W. A. Read and R. Buxton. —p. 493.
Red Cross Blood Program. G. B. Dowling.—p. 498.
Foreign Bodies in Gastro-Intestinal Tract. R. L. Payne Jr.—p. 503.
Varied Allergic Reactions to Penicillin. J. B. Black Jr., J. W. Thomas, W. R. Graham and DuP. Guerry III.—p. 505.
Myocardial Infarction: Review of 100 Cases. J. R. Beckwith, W. R. Chitwood and A. E. Le Hew.—p. 511.
*Indiscriminate Use of Estrogens in Menopause. J. M. Habel Jr.—p. 517.
Report of 62 Cases of Infectious Hepatitis Occurring in 1946, Station Hospital, Camp Lee, Virginia. J. F. Schieve.—p. 521.
Colles' Fractures. T. B. Strange.—p. 526.

Indiscriminate Use of Estrogens in Menopause.—Habel points out that the increasing number of patients seen with uterine bleeding due to overstimulation of estrogenic hormones, and a recent article by Ayre, showing a definite relation between nutritional deficiency, excessive estrogens and inflammation as a possible cause of cancer of the cervix, led him to examine some of the effects of the excessive use of estrogens. There has been much controversy on the question of whether estrogenic substances can cause cancer or not, and the general conclusion is that they cannot, if given in the usual therapeutic doses. However, women who have late menopause—that is, between the ages of 50 and 55—are more prone to have adenocarcinoma of the uterus. It has also been stated that a woman experiencing a functional menorrhagia or metrorrhagia at the menopause, particularly a woman with evidence of persisting estrogenic effect in her postmenopausal years, should be regarded as predisposed to the development of adenocarcinoma of the uterus. It has been found that in cases of granulosa cell tumor of the ovary in postmenopausal women the incidence of carcinoma of the uterus is very high. Since this type of tumor causes an abnormal estrogenic stimulation, it is highly suggestive of estrogen-cancer relationship. The author further shows that the excessive use of estrogenic hormone may produce excessive bleeding and that the prolonged use of estrogenic substances will often cause prolongation of the menopause. Addiction enters into the indiscriminate use of estrogens. These undesirable effects can be prevented if patients are carefully selected and such substances as vitamin B_1, vitamin E and male sex hormone are substituted for estrogenic substances. Small doses of estrogens given over a short period of time in selected cases are desirable, but self medication should be discouraged.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

56:513-564 (Oct.) 1948

Surgical Reflections, Mainly Regarding Cancer of Breast. L. B. Sherry. —p. 513.
Surgical Treatment of Carcinoma of Thoracic Esophagus: Technic of Transthoracic Thoracolaparotomy with Esophageal Resection and High Esophagogastrostomy. L. A. Brewer III and F. S. Dolley. —p. 517.
Testicular Pathology in Selected Cases of Endocrine Disorders. G. L. Laqueur.—p. 529.
Cesarean Section and Incidental Correction of Uterine Prolapse. S. S. Rosenfeld.—p. 535.
Intestinal Obstruction. C. L. Wagner, E. M. Rideout and E. B. Speir. —p. 537.
Surgical Procedures in Treatment of Chronic Clubfoot. L. S. Lucas. —p. 542.
Spinal Anesthesia in Vaginal Delivery: Report of 381 Cases. L. E. Smale and Virginia Pallais.—p. 545.
*Refrigeration in Obstetric Crises. F. M. Allen.—p. 548.
*Two Hour Pregnancy Test, Based on Rat Ovary Hyperemia. P. H. Fried.—p. 552.
Production of Ovulation in Anovulatory Patient. L. F. Bushnell.—p. 556.

Refrigeration in Obstetric Crises.—According to Allen obstetric hemorrhage is the principal cause of maternal death. Obstetricians of a former generation are said to have used the abdominal tourniquet as a final means of stopping postpartum hemorrhage. The method seems to have been abandoned and forgotten, doubtless because of the possibility of shock, paraplegia or organic damage. The author points out that these dangers can be reduced in proportion to the reduction of temperature. The unconscious or deeply anesthetized woman should be picked up by the feet and legs and held vertically with head down, to let all possible blood flow toward the head and the intestine fall toward the diaphragm. A tourniquet should be applied quickly around the abdomen just above the pelvic bones, and the patient immediately replaced horizontally on the table. A large very elastic pure rubber tube should be applied in several superimposed turns. The aorta and other arteries should thus be easily occluded. The legs and abdomen up to an inch or two above the tourniquet should be completely surrounded by finely crushed ice. Though every effort should be used to make the time of tourniquet application as short as possible, reasonably efficient refrigeration will provide ample time for both transportation and operation, even up to the six hour duration. After surgical hemostasis, when the tourniquet is removed, the body temperature should be raised rapidly to a little below normal.

Two Hour Pregnancy Test.—Fried shows that the two hour rapid rat ovary hyperemia pregnancy test is advantageous because of its increased sensitivity and rapidity, the rarity of false positive reactions, the increased tolerance of the rat to toxic specimens of urine and the conveniences of the test and test animals. However, unfavorable features are the false negative reactions and the lack of a sharp positive end point.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2:629-668 (Oct. 2) 1948

Present State of Knowledge of Anatomy of Primates. F. W. Jones.—p. 629.
Carcinoma of Breast and Its Treatment. C. Wakeley.—p. 631.
Early Diagnosis and Treatment of Carcinoma of Breast. V. Riddell.—p. 635.
Papilloedema in Emphysema. T. Simpson.—p. 639.
Out-Patient Electric Convulsion Treatment. W. P. Mallinson.—p. 641.
Case of Gross Overdosage of Soluble Phenytoin. T. N. Nauth-Misir.—p. 646.

Journal of Royal Army Medical Corps, London

91:51-92 (Aug.) 1948. **Partial Index**

Work and Problems of a Medical Officer Prisoner of War in the Far East. J. E. C. Robinson.—p. 51.
Group Therapy and Its Application in the British Army Today. J. T. Robinson.—p. 66.
*Early Diagnosis of Infective Hepatitis in Syphilitic Patients Undergoing Arsenical Therapy. W. Fowler.—p. 80.

Early Diagnosis of Infective Hepatitis During Arsenical Therapy.—According to Fowler, the incidence of infective hepatitis is still great in syphilitic patients undergoing arsenical therapy despite the care taken in venereal disease clinics to avoid dissemination of the causal virus. A diagnosis of hepatitis is seldom made prior to the appearance of bile in the urine, although it can be diagnosed in the preicteric stage by the intradermal histamine test of Kline. Unfortunately early symptoms such as nausea and loss of appetite, which would lead one to perform this test, are frequently so slight as to be disregarded. When examining records of cases of "arsenical jaundice," it was noted that in the majority of cases a loss of weight occurred shortly before signs of jaundice appeared. Attention to the weight of patients on antisyphilitic treatment and the Kline test on patients who lost 2 pounds (907 Gm.) or more within a week revealed that of 64 patients who contracted hepatitis 56 showed a loss of weight of 2 pounds or more seven to ten days before bile appeared in the urine. It is suggested that the use of Kline's test for all patients who show a sudden loss of weight of at least 2 pounds provides an easy and effective method of diagnosing infective hepatitis in the preicteric stage.

Lancet, London

2:517-554 (Oct. 2) 1948

*Penicillin in Diphtheria: Report of Subcommittee of Public Health Laboratory Service. R. Cruickshank and others.—p. 517.
*Thymine, Folic Acid and Vitamin B_{12} in Nutritional Macrocytic Anemia, Tropical Sprue, and Pernicious Anemia. T. D. Spies, R. E. Stone, G. G. Lopez and others.—p. 519.
*Exchange Transfusion in Hemolytic Disease of Newborn. P. L. Mollison and M. Cutbush.—p. 522.
Influence of Restraint on Automatic Movements: Value in Diagnosis. V. Vujic and K. Kurtes.—p. 527.
Primary Carcinoma of Liver in Boy Aged 15. A. E. Beynon.—p. 528.
Delayed Pneumonitis in Beryllium Worker: Report of Case. J. N. Agate.—p. 530.

Penicillin in Diphtheria.—Cruickshank and his associates of the Public Health and Laboratory Service studied the penicillin sensitivity of 284 strains of Corynebacterium diphtheriae isolated in different parts of the country. Most of the strains tested were two or three times as resistant to penicillin as the Oxford staphylococcus. Gravis strains in C. diphtheriae were more resistant to penicillin than intermedius, and intermedius were more resistant than mitis types. All patients with acute diphtheria received antitoxin in doses depending on the severity of the case. A single bath of crystalline penicillin (sodium salt) was used. The standard adult dose was 60,000 units given intramuscularly every four hours during the day time only (daily dosage 240,000 units). Children up to 4 years of age received a third, and children aged 5 to 10 years two thirds, of the adult dose. Children over 10 years were treated as adults. Of 65 patients with acute faucial diphtheria treated with penicillin, 26 of 37 receiving a three day course and 23 of 28 receiving a six day course became free from the infecting organism within four days of the end of treatment. In 31 persistent diphtheria carriers treatment with penicillin was followed by the rapid disappearance of the organism from the throat in only 13 cases.

Thymine, Folic Acid and Vitamin B_{12} in Anemias.—Spies and his associates made a comparative study of thymine, folic acid and vitamin B_{12} under controlled conditions on selected patients with macrocytic anemia in relapse. One patient with pernicious anemia, one with nutritional macrocytic anemia and one with tropical sprue were each admitted three times to the hospital and given a diet free from meat and meat products. Base line determinations were made on each admission. Each compound produced a blood response and a definite clinical improvement. The fact that three distinct chemical compounds have proved effective in each of three distinct syndromes suggests that we may learn a great deal about the pathogenesis of these diseases. It appears that several thousand times the weight of thymine is required to produce a response similar to that produced by folic acid and that several thousand times the weight of folic acid is required to produce a response similar to that produced by vitamin B_{12}. These findings suggest that vitamin B_{12} is by far the most potent antianemic substance known.

Exchange Transfusion in Hemolytic Disease of the Newborn.—Mollison and Cutbush advance the following aims for exchange transfusion in the treatment of hemolytic disease of the newborn: (1) to raise the hemoglobin level rapidly without increasing the blood volume; (2) to reduce to a minimum the amount of breakdown of Rh-positive cells during the critical first four days of life, since it is possible that the blood destruction in this phase is indirectly responsible for the tissue damage, and (3) to provide the infant with such a concentration of Rh-negative cells that no further transfusions will be needed. In their experience this has proved to be the most substantial advantage of exchange transfusion. The percentage exchange effected by withdrawing the infant's own erythrocytes and replacing them with Rh-negative erythrocytes depends on the infant's and donor's initial red cell counts as well as on the total volume of blood exchanged. It is important to secure a good percentage exchange of Rh-negative cells for Rh-positive cells and to leave the infant with a high absolute concentration of Rh-negative cells to tide it over the subsequent forty days or more, during which it is unable to maintain a satisfactory concentration of Rh-positive cells. This objective is best achieved by the use of donor's blood with a count of 5,000,000 to 6,000,000 erythrocytes. The severity of hemolytic disease of the newborn can be assessed reliably from an examination of cord blood. Although the authors have gained a favorable impression of the clinical effects of exchange transfusion, they admit that it has not as yet been proved whether it lowers mortality and morbidity. Since they have observed no ill effect from it, they consider it the most convenient therapeutic method available, but it is not a trivial procedure and should be reserved for cases in which a single transfusion of Rh-negative blood is not likely to suffice.

Medical Journal of Australia, Sydney

2:169-196 (Aug. 14) 1948

Surgical Pathology of Brain Abscess. G. Swinburne.—p. 169.

2:197-224 (Aug. 21) 1948

Impressions of Tuberculosis Abroad. D. R. W. Cowan.—p. 197.
Treatment of Blocked Fallopian Tubes by Pressure Injections of Gas and Iodized Oil. A. Grant and R. Mackey.—p. 199.
Malignant Disease of Testis. J. Broughton.—p. 204.
Listeria Meningitis: Description of Strain of Listeria Monocytogenes and Report of Case. N. F. Stanley.—p. 205.

2:225-252 (Aug. 28) 1948

Distribution and Availability of Nutrient Production in New South Wales. H. S. H. Wardlaw, E. G. Hallsworth, S. C. Graham and W. H. Pawley.—p. 225.
*Gangrene of the Leg Following High Ligation of Great Saphenous Vein. J. S. T. T. Hill.—p. 238.

Gangrene of Leg Following Ligation of Saphenous Vein.—Hill reports the case of a man on whom he performed a high ligation of the left great saphenous vein under general anesthesia. The vein was injected distally with 20 per cent

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sodium chloride solution. The patient was apparently fit; he was a laborer with bilateral varicose veins. An uncomplicated operation apparently precipitated arterial spasm which resulted in gangrene of the leg below the knee, necessitating amputation through the thigh, eight days after the ligation had been done. This man apparently was prone to arterial spasm, as he had previously suffered a transient cerebral upset. Only the saphenous vein was exposed; the femoral artery was not interfered with in any way. The dissection of the vein in the neighborhood of the artery apparently precipitated an immediate spasm, with subsequent thrombosis. This case shows an unexpected and tragic sequel to an operation for a condition not usually regarded as dangerous.

Chinese Medical Journal, Shanghai

66:291-350 (June) 1948

*Weil-Felix Reaction in Typhus and Non-Typhus Fevers. Wei-T'Ung Liu.—p. 291.
Antigenicity and Toxicity of Alkali Treated Horse Serum. S. H. Zia, Yü-Cheng Ma, Chang-Tsai Chi and Shang-Chih Hsu.—p. 307.
Gonorrhea Among Prostitutes: Survey of Incidence and Attempt at Oral Sulfadiazine Prophylaxis. L. W. Chu and C. H. Huang.—p. 312.
Malaria in Southern and Western Szechuan with Note on Occurrence of Schistosomiasis Japonicum. Kuo-Chin Hsu.—p. 319.
Canine Leishmaniasis in Honan: Report of Case. Tze-Huei Hsu and Eutrope A. Ho.—p. 324.
First Two Cases of Transfusion Kala-Azar. Huei-Lan Chung, Hua-K'Ang Chow and Jui-Ping Lu.—p. 325.
Cutaneous Leishmaniasis: Case Report. M. Osnes.—p. 327.

The Weil-Felix Reaction.—Wei T'Ung Liu says that the serums of most of the patients admitted with fever to the Peiping Union Medical College Hospital were tested for the presence of agglutinins for Eberthella typhosa "H" and "O," Salmonella paratyphi, Salmonella schottmülleri, Salmonella choleral suis, Salmonella enteriditis, Proteus vulgaris OX19, Brucella melitensis and Brucella abortus. The tests were repeated until the cause of fever was ascertained. Special attention was given to the Weil-Felix reaction. Results in 286 cases of typhus, 536 cases of enteric fever and 1,862 cases of miscellaneous fevers are reported. A negative Weil-Felix reaction was obtained in 6.6 per cent of the 286 patients with typhus. In those with a positive reaction the titers varied widely. The duration of persistence of agglutinin during convalescence varied directly with the height of titer attained from a few weeks to longer than two to three months. In 2,398 cases of nontyphus fevers, 7.4 per cent gave positive reaction. It is concluded that the Weil-Felix reaction should be evaluated only in correlation with the clinical disease. No arbitrarily set titer, nor a rise in titer, is necessarily significant of active typhus infection; nor can it be excluded by the complete absence of OX19 agglutinin through the disease and during convalescence.

Lyon Chirurgical, Paris

43:513-640 (Sept.-Oct.) 1948. **Partial Index**

*Results of 94 Arteriectomies Performed in the Service of Prof. Leriche During Period of March 1942 to January 1947. C. Mentha.—p. 513.
*Effect of Prefrontal Unilateral Left Leukotomy on Cerebral Dominance: "Diphreny." A. Ricard and P. F. Girard.—p. 526.
Salpingostomy and Sterility. E. Pollosson.—p. 533.

Results of 94 Arteriectomies.—Mentha reports on ninety-four arteriectomies performed in the service of Professor Leriche on 80 patients, 76 men and 4 women between the ages of 45 and 75 with presenile and senile arteritis. Thirty-five patients were treated by unilateral or bilateral arteriectomy alone, while in the remaining 45 patients the arteriectomy was combined with homolateral, contralateral or bilateral lumbar sympathectomy. Eighty-nine excisions of a portion of the superficial femoral artery and five excisions of a portion of the primary iliac artery were performed. Excellent results were obtained in 6 patients and satisfactory results in 21. Eighteen patients were improved, 12 stabilized. Three were partial failures and 14 were total failures. Death occurred in 6 patients. Follow-up of the patients for one to five years demonstrated that there was progressive improvement in many cases. Arteriectomy alone may be performed on patients with poor general condition, while it may be combined with lumbar sympathectomy in those with fair general condition. The combined treatment has the advantage of adding upward vasodilation to the downward vasodilation resulting from the arterial excision. Considering that the site of the obliteration had to be determined without the aid of arteriography and that anticoagulants were not available for postoperative treatment, the results obtained suggest that arteriectomy alone or combined with sympathectomy is at present the most efficient method for treatment of chronic obliterative arteritis of the presenile and senile type.

Prefrontal Leukotomy.—According to Ricard and Girard, it is generally admitted that the aim of the prefrontal leukotomy is to free the psychomotor activity from its elementary instinctive and affective "afferences" by the section of the thalamoprefrontal fibers. Performed unilaterally it may produce important modifications in cerebral dominances. A hereditary predisposition induces every person to build all his or her physical and intellectual activity and very likely the entire personality on the hemisphere which is called the dominant. Educative circumstances may be responsible for partial transfer of the activity on the nondominant hemisphere. Dipraxy is the term coined for the functional disturbances resulting from the superposition in the same person of the double action of the praxic centers intended for the same acts. The term diphreny is suggested for the considerable psychic disturbances which may result likewise from the double intellectual activity, double will or double personality. Left unilateral prefrontal leukotomy is recommended for cases of this type. This operation may reestablish the normal predominance of one hemisphere over the other and thus restore psychic balance. Considerable improvement was obtained from this surgical treatment in 2 patients, a nun aged 50 and a priest with obsessions aged 35. Results were less satisfactory in 2 schizophrenic patients, a woman aged 20 and a man aged 40.

Semaine des Hôpitaux de Paris

24:2415-2450 (Oct. 10) 1948. **Partial Index**

*Contribution to Study of Surgical Sciatica. Position and Role of Pseudomyxoid Degenerescence of Intervertebral Disk. Statistics of 59 Cases. R. Fontaine, A. Dany and R. Riveaux.—p. 2415.
Treatment of Epiphyseal Fractures by Temporary Transarticular Pegs. J. and R. Judet.—p. 2423.
Attempt of Classification of Bone Diseases. F. Masmonteil.—p. 2427.

Surgical Sciatica.—Fontaine and his co-workers report 59 patients with refractory sciatica, due to herniation of the intervertebral disk in 20, to hypertrophy of the ligamentum flavum in 15, to bone lesions in 5, secondary to tumors of the bone marrow, nerve roots or the vertebral column in 10, and of indeterminable origin in 9. Of the 20 patients with sciatica due to herniation of the disk, 15 were men and 5 were women, between the ages of 19 and 53 years, with the highest incidence in the age group between 30 and 50 years. In only 11 of these patients did herniation of the disk result from trauma. Microscopic examination of the removed disk was performed in 9 cases, and pseudomyxoid degeneration of the disk was revealed in 5. The disease of the disk is the primary phenomenon in the sciatica due to herniation of the disk; it explains the frequency of herniation of the disk in the absense of trauma or in the presence of minimum trauma. Complete recovery resulted in 18 patients from the surgical removal of the degenerated disk by the intradural or extradural route. For three months after the intervention 1 patient presented sciatic pain which subsided after several lumbar infiltrations. One patient presented a temporary syndrome of cauda equina paresis. Follow-up of 14 of these patients for several years demonstrated a permanent recovery in 13, while 1 patient complained of lumbago but in the absence of sciatic pain. Extensive laminectomy involving two to three laminas was performed systematically in this series of 20 patients and was justified by the results. Complimentary posterior radicotomy is superfluous. In general, localization of the herniation of the disk may be revealed by neurologic examination alone and roentgenographic examination with iodized oil as contrast medium is not necessary. In the 39 patients whose sciatica was due to other causes than herniation of the disk, the immediate and late results of surgical intervention were less satisfactory. In some of these cases better results were obtained from laminectomy combined with posterior radicotomy, but there were likewise failures.

Book Notices

Manual for Medical Records Librarians. Edna K. Huffman, R.R.L., Director, Program in Medical Records Library Science, Northwestern University, Chicago. Second edition. Cloth. Price, $4.50. Pp. 371, with 73 illustrations. Physicians' Record Company, 161 W. Harrison St., Chicago 5, 1948.

Hospitals have among primary obligations the responsibility for maintaining a medical record department. The author of this volume has provided a worth while contribution for information of medical record librarians and hospital administrators. All medical record librarians will be rewarded and enlightened by study of the general outline of this guide. Although a book of this kind is needed, it is obvious that a considerable amount of the material is obsolete and that other chapters should be expanded. The author suggests grouping diseases where the "Standard Nomenclature of Disease and Standard Nomenclature of Operations" is used. This is not a recommended practice. Terminology used in the "Standard Nomenclature" is chosen after considerable thought, the purpose of which is accuracy of language and accuracy of diagnosis. Record librarians in all hospitals should be consistent in the installation and maintainance of the "Nomenclature." Grouping of diagnosis either etiologically or topographically on one card is not recommended. Tumors and fractures should not be separately grouped but should be filed in accordance with the over-all filing system; for instance, one would not think of grouping actinomycosis in an etiologic group separated from the usual filing sequence. This type of diagnostic filing is dangerous. Unless accuracy and consistency is maintained, the value of the Nomenclature system is lost. In spite of recorded objections, there is much general information of merit included.

Major Endocrine Disorders. By S. Leonard Simpson, M.A., M.D., F.R.C.P., Physician, Willesden General Hospital, with Charge of Diabetic and Endocrine Clinics. Foreword to First Edition by the late Sir Walter Langdon-Brown. Oxford Medical Publications. Second edition. Fabrikoid. Price, $14. Pp. 552, with 89 illustrations. Oxford University Press, 114 5th Ave., New York 11; Amen House, Warwick Sq., London E.C. 4, 1948.

This is an interesting volume for those especially concerned with the subject, representing the personal experience and opinions of a British leader in clinical endocrinology. The interest is enhanced by a more than average degree of individuality in style and expression, which is not without charm.

The descriptions of the clinical syndromes are good, and the author's comments on variations and combinations of syndromes obviously spring from a rich experience and an alert mind. However, the psysiologic considerations raised by the author are sometimes outdated by American standards, and the sections on treatment are rather weak and incomplete. Altogether, this volume belongs in the collection of the endocrinologist, rather than on the working shelf of the general practitioner or the medical student.

Handbook for the Medical Secretary. By Miriam Bredow, Dean of Women, Eastern School for Physicians' Aides, New York. Second edition. Cloth. Price, $2.75. Pp. 389, with 36 illustrations. McGraw-Hill Book Company, Inc., 330 W. 42d St., New York 18; Aldwych House, Aldwych, London, W.C. 2, 1948.

Efficient medical secretaries are said to stimulate better care of patients in office practice. This book contains a wealth of useful information. The author's wide experience in offices of physicians and in teaching medical secretaries provides a pertinent source of information on all aspects of medical routine, such as appointments for patients, keeping appointment books, interviewing new patients, writing and filing patients' case histories and clinical office procedures for the doctors' medical assistants. Chapters are included on office nursing technics and duties of dental secretaries. The section on preparation of manuscripts provides useful hints for medical writing. Proper pronunciation and spelling of medical terms is stressed, and approximately two thousand of the most frequently used terms, prefixes, suffixes and abbreviations are listed. Both physician's and dentist's secretaries will find this volume useful as a ready reference for improving the quality of their everyday work.

Manual of Urology. By R. M. LeComte, M.D., F.A.C.S. Fourth edition. Cloth. Price, $4. Pp. 311, with 58 illustrations. Williams & Wilkins Co., Mt. Royal & Guilford Aves., Baltimore 2, 1948.

This manual of urology is the fourth edition since 1933. The general outline has not been altered from the previous editions. This one contains 311 pages divided into eleven chapters. The first three chapters deal with methods of examination in urology, symptomatology and treatment. Then follow eight chapters devoted to disease of the genitourinary system. The principal changes and alterations that have been made in this edition are in the treatment of infections of the genitourinary system with the sulfonamide compounds, penicillin and streptomycin. The management of urinary calculi has been brought up to date. The work on testicular tumor has been rewritten.

This is primarily a book for medical students and because of its conciseness will continue to be popular.

Urology for Nurses. By Oswald Swinney Lowsley, M.D., F.A.C.S., Director of the Department of Urology (James Buchanan Brady Foundation) of the New York Hospital, New York, and Thomas Joseph Kirwin, M.D., F.A.C.S., Attending Surgeon, Department of Urology (James Buchanan Brady Foundation) of the New York Hospital. Second edition. Cloth. Price, $6. Pp. 687, with 130 illustrations by William P. Didusch. J. B. Lippincott Co., 227-231 S. 6th St., Philadelphia 5, 1948.

This new and revised second edition contains 663 pages divided into nineteen well arranged and organized chapters. The first few chapters deal with the history of urology; the social psychology of the nurse and the use and care of the various urologic instruments. Adequately discussed in separate chapters are cystoscopy and roentgenography, urine and blood examinations and the various tests for renal function. A chapter is devoted to anesthesia in urologic practice.

More than two thirds of the book is devoted to diseases of the genitourinary system. A chapter is devoted to each organ in which the embryology, anatomy and physiology are first taken up, followed by detailed discussion of the anomalies, injuries and diseases of the particular organ. Adequate emphasis is given to operative and nonoperative treatment. The surgical procedures are well illustrated, as is the book in general. It appears that special effort has been made to present the material in a clear, concise and well organized manner. The practical side of nursing in the field of urology has not been neglected.

This book can be highly recommended as a textbook for the teaching of nurses. As a matter of fact, the medical student and intern will find the book of considerable value in obtaining a better understanding of urology.

Advances in Biological and Medical Physics. Volume I. Edited by John H. Lawrence and Joseph G. Hamilton. Cloth. Price, $8.60. Pp. 484, with illustrations. Academic Press, Inc., 125 E. 23rd St., New York, 1948.

This book is the first of a series of volumes to be published yearly. These are to include the most salient advances in biologic and medical research through the use of radioactive and heavy isotopes in the previous year. This volume contains ten sections, the authors of each being prominent men in their fields. Each section is followed by a comprehensive, up-to-date bibliography. The subject material has been well selected, a feat not easily accomplished when one considers the volume of research produced in this comparatively new field.

The first section deals with a general survey of heavy and radioactive isotopes which are being used or could be used in biologic and medical research. Following this are sections presented in concise detail on the production of artificial radioactivity, the fundamentals of radioactivity and instrumentation. These are important, for it is essential that those working with radioisotopes should have a working knowledge of the characteristics of radioactivity. Health physics and radiation tolerances are also discussed.

No field in biologic research has advanced so rapidly by the use of isotopes as that of intermediary metabolism. This is clearly presented in papers dealing with nitrogen and carbon metabolism, phospholipid metabolism, and nucleic acid metabolism.

For the clinician, there are three excellent presentations. One deals with the absorption, metabolism and fate of iron and its

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role in the formation of hemoglobin and the red blood cells. The second is the study of thyroid physiology with radioactive iodine. The third, a very important one, presents the pertinent findings of atomic bomb irradiation in the Japanese.

Essentials of Pathology. By Lawrence W. Smith, M.D., F.C.A.P., Associate Professor of Pathology, Cornell University Medical School, New York, and Edwin S. Gault, M.D., F.C.A.P., Associate Professor of Pathology and Bacteriology, Temple University School of Medicine, Philadelphia. With a foreword by the late James Ewing, M.D. Third edition. Fabrikoid. Price, $12. Pp. 764, with 740 illustrations. The Blakiston Company, 1012 Walnut St., Philadelphia 5, 1948.

In the third edition of this textbook of pathology the form has been reduced to a conventional size, the text revised and augmented with new material, case histories condensed, repetitious and less important histories omitted, sixty-one new figures added, including four in color, and the bibliography brought up to date. The original format, with the text and illustrative case histories facing a page of photographs, has been retained. The authors have adhered well to their tenet that because of the limited time at the disposal of students today a textbook should be practical and restricted to absolute essentials. As a result, this book is an excellent textbook for beginners in pathology as well as for others who wish quickly to refresh their memories. It was not intended as a reference book for pathologists, some of whom, forgetting this, have criticized the book for its lack of scope and its avoidance of controversial issues. Textbooks might well at times be reviewed by students rather than by teachers. This reviewer, in the course of his teaching, noted that the new edition of "Essentials of Pathology" was widely used in his laboratory despite the fact that it had not been specifically recommended. The students using it did well in the course, many ranked high in the examinations, and several floundering students found in it the solution to their dilemma. With the students foremost in mind, academic pathologists should overlook the omissions of detail and brevity of discussion in this book and accept it as an excellent textbook in that it enables students quickly to develop a firm foundation in clinically applicable pathology.

Traitement des dermatoses communes: Diagnostic d'après les lésions, schémas pathogéniques, topographie. Par A. Desaux. Cloth. Price, 1960 francs. Pp. 1300, with 320 illustrations. Masson & Cie, 120 Boulevard Saint-Germain, Paris 6e, 1948.

This book offers much more than one would expect from the title. It is written in a clear and concise style and not only deals with the skin as an autonomous organ, but correlates the cutaneous organ and its manifestations with the entire field of medicine.

The first part (120 pages) describes the histophysiology of the skin, methods and technics of examination, including "Brocq's Alphabet of Dermatological Lesions" and allergic and biologic tests. The second part deals with the diagnosis and treatment of the common dermatoses, which are classified according to their primary lesions and localization. Rare dermatoses are briefly mentioned.

The book offers a wealth of carefully selected methods of therapy, including physiotherapeutic procedures. Each of the 320 photographs is accompanied by an extensive descriptive text.

The book is written primarily for students and junior dermatologists. The experienced specialist will also find it of value in that it groups and classifies a vast amount of well established and newer forms of therapy. The bibliography is extensive and complete.

Breast Feeding: A Guide to the Natural Feeding of Infants. By F. Charlotte Naish, B.A., M.B., B.Ch. Awarded Sir Charles Hastings Clinical Essay Prize, 1947. Oxford Medical Publications. Fabrikoid. Price, $3.50. Pp. 151, with 20 illustrations. Oxford University Press, 114 Fifth Ave., New York 11; Amen House, Warwick Sq., London, E. C. 4, 1948.

This book would have been much easier to review had the author specifically stated its purpose and for whose benefit it was written. If it was written for the medical profession, it is entirely superfluous, full of clichés, devoid of scientific observations and with scarcely an original idea. If written for the guidance of nursing or prospective mothers, it is a mixture of medical and nursery jargon and pseudodoxy, which will hardly meet the requirements of a popular book. Many of its inaccuracies are naive; some of its statements amusing, other subject to challenge. The author has gone to some lengths to belabor the obvious and to omit the essential. The subject could lend itself to an excellent little work for the guidance of mothers or, on a truly scientific plane, for the instruction of practitioners; as it is, it is neither.

Among the more glaring inaccuracies in this little volume are such statements as that an infant should nurse the breast with acute mastitis; that it is dangerous to teach that the breast must be emptied at each feeding; that the rate of growth is so much slowed down in the second six months that there seems little chance, indeed, of making up any lack of chest expansion that is found to exist at the age of 6 months; that it is important to have good early feeding, because of the necessity of distending the child's stomach in infancy, so that it can cope with the questions of food necessary for the growth and vigor of childhood.

In marked contrast, the *Journal of Pediatrics* for November 1948 (**33**:660) has a 6 page article entitled "Breast Feeding," by Samuel Stone and Harry Bakwin, which is a splendid example of how accurately and concisely this subject can be treated. It says much more in 6 pages than Dr. Naish tries to say in 149.

How to Conquer Your Handicaps. By Marie Reynon Ray. Cloth. Price, $3. Pp. 336. Bobbs-Merrill Co., 724 N. Meridian St., Indianapolis 7, 1948.

This book is written to honor the pioneers in medicine and surgery who have developed new technics for the disabled; the handicapped who achieved greatness in spite of their handicaps and the organizations which are helping the physicians and handicapped persons become useful citizens. The author states that her purpose is to tell the public in simple, nontechnical language the new developments in medical science for the preservation of man, as so much has been written on methods of destruction.

The development in orthopedic and plastic surgery, the methods used in the rehabilitation of the blind, deaf and those with speech defects and how through medical science the aged may still achieve success are told in an interesting and friendly manner. The book makes available the names of all the great men and women whose handicap contributed to their success, the names of physicians and surgeons and the institutions and organizations devoting their efforts to the development of methods for overcoming the handicaps produced by disabilities.

This book is recommended to physicians who are interested in knowing about the "third phase of medical care," or rehabilitation, and to those with disabilities who desire to conquer their handicaps.

Recent Advances in the Study of Venereal Diseases: A Symposium. Held under the auspices of the Syphilis Study Section, Division of Research Grants and Fellowships, National Institute of Health, U. S. Public Health Service in the auditorium of the U. S. Department of Commerce, Washington, D. C., April 8-9, 1948. Chairman, Syphilis Study Section: J. E. Moore. Paper. Price, $1.50. Pp. 341, with illustrations. Published in cooperation with the United States Public Health Service. Venereal Disease Education Institute, 216 North Dawson St., Raleigh, N. C., 1948.

Current investigative studies in human and experimental syphilis, as well as in the minor venereal diseases, are presented in this volume. The statistical analyses of the latest available results in a nationwide study of the treatment of early syphilis with penicillin are as valuable to the internist as they are to the syphilologist and to the public health officer. The presentations of the results of treatment of the various types of neurosyphilis with penicillin alone and with combined malaria and penicillin offer to the neurologist, the ophthalmologist and the internist the latest data on these controversial therapeutic problems. The current status of cardiolipin antigens, which represent a significant advance in serologic tests for syphilis, is presented.

This volume contains a number of individual investigations on which current concepts of diagnosis, epidemiology and treatment of venereal diseases are based. However, this volume is a symposium, and it contains much diversity of opinion. It does not represent a systematized presentation of current studies in the field of venereal diseases.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

TREATMENT FOR TAPEWORM

To the Editor:—**What is the best treatment of tapeworm (Taenia saginata) in a 2½ year old child weighing 28 pounds (12.7 Kg.)? Please give exact dosage and procedure.**

Bianca Sender, M.D., New York.

ANSWER.—The success of therapy of Taenia infections depends largely on careful preparation of the patient to insure an upper digestive tract free of food, which enables the drug used to come in intimate contact with the worm. Children not infrequently vomit the anthelmintics used in tapeworm therapy, which greatly reduces their effectiveness and often necessitates repeated treatments or resort to the duodenal tube for administration of the drug.

Preparation of the Patient.—A liquid luncheon but no supper is allowed the day preceding treatment. Water or carbonated drinks can be taken freely, but milk should not be permitted after luncheon.

Administration of the Anthelmintic: At 8 a. m., 6 cc. of the following emulsion is administered: oleoresin of aspidium 1 cc. or Gm., powdered acacia 1.5 Gm. and water sufficient to make up to 12 cc. One hour later the second 6 cc. of the emulsion of aspidium should be given. If the child is uncooperative and will not swallow the aspidium mixture or if he vomits it, the drug may be given by duodenal tube. Two hours later (11 a. m.) one flat teaspoonful of magnesium sulfate should be given in a glass of water, to be followed two hours later with a soapsuds enema. All stools resulting from the purge and enema should be passed into a container and examined for tapeworm. Search should be made for its head. Toilet paper should not be thrown into the bedpan, as it makes search difficult and the tapeworm head may adhere to it. The child should rest in bed during treatment.

Hexylresorcinol, which is nontoxic and effective, involves administration of the drug by duodenal tube. It may be substituted for the aspidium mixture. The preparation of the patient and all other details of treatment are the same. At 8 a. m. a mixture of 0.30 Gm. hexylresorcinol and 2 Gm. of powdered acacia in 20 cc. of water is given by duodenal tube. The hexylresorcinol is secured by removing the outer gelatin coating from three 0.1 Gm. crystoids anthelmintic® pills of Sharp & Dohme Company and thoroughly pulverizing the inner pills.

If large sections of the tapeworm are passed but the head is not found, treatment should not be instituted again for two to four months, as it is possible that the head was removed but missed in the stool search. If the head remained in the child, a new tapeworm will grow and eggs and segments will appear in the stool in several months, at which time the child should be treated again.

"OTTO" PELVIS

To the Editor:—**What information is available on "Otto" pelvis, particularly as to causation and treatment and its incidence in children?**

Ernest E. Myers, M.D., Lexington, Ky.

ANSWER.—Intrapelvic protrusion of the acetabulum or "Otto" pelvis involves the hip joint and is usually seen in adults. It occurs in women twice as often as in men. The cause is obscure, but any condition which results in "softening" of the bone about the acetabulum may permit this deformity to develop. It has not been recognized often in children. Pomeranz published a complete account of this interesting lesion (*J. Bone & Joint Surg.* **14**: 663-686, 1932).

SCHOENLEN'S PURPURA

To the Editor:—**What is the approved treatment for Schoenlein's purpura? My patient is a woman 25 years old. She does not have symptoms except for frequent eruptions of purpuric spots.**

M. D., New York.

ANSWER.—Satisfactory treatment for Schoenlein's or so-called allergic purpura is not known. Sensitization to certain foods is thought to be a cause of this type of purpura, but it is seldom possible to prove such a relationship. Spontaneous recovery is common.

WARTS

To the Editor:—**In a male patient aged 20 warts developed around bases and lateral margins of the finger nails. The patient was stationed at an army camp in Georgia. He has been treated by many specialists in dermatology with poor results. The warts are disfiguring and uncomfortable. Some of the finger nails have come off and are starting to be replaced. What do you suggest?**

M.D., Oklahoma.

ANSWER.—The long list of remedies recommended for the treatment of warts indicates clearly that all of them may prove to be beneficial in some cases, but not in all cases. The remedies include internal measures such as potassium arsenite solution, protiodide of mercury and magnesium sulfate by mouth; destructive measures such as freezing with solid carbon dioxide, the application of liquid air, cautery, diathermy; the application of either salicylic acid in flexible collodion or a heavy oil such as castor oil; radiation with either roentgen rays or radium; bismuth compound administered intramuscularly or directly under the wart; specific vaccine and hypnosis or some allied measure which depends on suggestion.

It might be well in this case to apply radium to the warts, but it must be applied with skill and caution by one with experience in the method. If such treatment is not available, apply a 20 per cent salicylic acid in flexible collodion once or twice during the day and overnight cover the warts with gauze soaked in castor oil. If a reasonable trial with this method should fail to secure results, bismuth salts may be administered intramuscularly by the same dosage and technic as when it is used for the treatment of syphilis. If necessary, one may resort to a destructive measure such as liquid air, if it is available, or to electrosurgery, although the latter may produce scars. Any of these measures are likely to eradicate the warts; yet it is possible that the warts may persist despite all such treatment. Then the patient will note one day that all of the warts have suddenly disappeared and credit for the cure will go to the last method that was used, even if it had no direct relation to the disappearance of the warts.

CEREBRAL INJURY

To the Editor:—**A boy 14 years old was in an automobile accident on July 5, 1948. Nose or ear bleeding or discharge from ears was not apparent. The boy did complain of a slight headache, not localized. The headache grew progressively worse. Examination of spinal fluid on July 20 revealed 24 red blood cells in the field and was otherwise negative. On Aug. 14, 1948 another examination of spinal fluid revealed 9 red blood cells in the field. Headaches still persist. Neurologic examination reveals no abnormality. I have the impression that the boy has subarachnoid bleeding. Are there other tests to substantiate such a diagnosis? What other explanation could be given for the persistent headache?**

F. Stuczynski, M.D., Brooklyn.

ANSWER.—Granting that the red blood cells discovered in the spinal fluid on July 20, 1948 were not there because of needle trauma of a vessel, it would appear that there had been some subarachnoid bleeding as the result of the injury on July 5. The hemorrhage into the subarachnoid space must have been slight. Twenty-four cells in the fluid would not have been sufficient to cause visible tinging of the subarachnoid fluid. While the case history states that the boy had no apparent (visible?) injuries, it does not state whether he was dazed or dizzy immediately after the injury. He did have slight generalized headache. The headache has grown progressively worse over a number of weeks but without the development of abnormal neurologic findings.

The combination of symptoms, spinal fluid findings and course as given suggests the possibility of one of two conditions—a subdural hematoma or a persistent cerebral edema. The symptoms of subdural hematoma may or may not become evident within a short period of the time of injury. If the symptoms, which are variable, but most commonly include headache, irritability, dizziness, disorientation, mental dulness and later vomiting and lethargy, develop gradually, the course speaks strongly for a subdural hematoma. Careful, repeated neurologic examinations, including ophthalmoscopic examination, should be made. Often positive neurologic signs cannot be discovered even when there is a subdural hemorrhage, but the symptoms, sometimes mistaken for neurotic ones, and the course point to the diagnosis. The hematoma may be bilateral and is commonly parietal in location. The treatment is surgical and consists of burr hole drainage of the hematoma. The other condition to be considered, persistent cerebral edema, is the result of seemingly minor contusion of the brain with a "vicious circle" edema; i.e., because the cranium does not allow for free swelling of the injured tissue, the drainage of fluid from the area is impaired with some resulting increase in the edema. The effects are noticed particularly if the patient is not kept in bed for a sufficient length of time immediately after injury. Hypertonic intravenous solution (sucrose 50 per cent, 100 cc.) and, possibly, lumbar puncture, removing 20 cc. of fluid, will help, but the chief treatment con-

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sists of rest in bed until the edema subsides and free circulatory drainage of the edematous area is established. In the case stated it would be well to keep in mind the possibility of subdural hematoma. Subdural hemorrhages may not organize as do other clots. The limiting membrane may serve as an osmotic wall for the absorption of still more fluid and the hematoma may encroach progressively on the cranial contents.

PROGNOSIS FOR Rh-NEGATIVE MOTHERS

To the Editor:—A 26 year old patient had a healthy baby in January 1948. She is pregnant again, and expected delivery is May 1, 1949. Examination of blood showed an Rh-negative reaction. The husband's blood is Rh positive. Although it is known that an Rh-negative mother may have a perfectly healthy baby, I should like to ask whether the infant should be given a transfusion through the cord with Rh-negative blood immediately after delivery, even before definite erythroblastosis of the infant has been discovered by blood studies. If blood transfusion is performed, should the blood be of the same type as that of the infant?

M.D., Connecticut.

ANSWER.—Not more than 1 in 20 Rh-negative women married to Rh-positive husbands give birth to infants with erythroblastosis in any pregnancy and the fact that a woman is Rh negative is not in itself reason to contemplate transfusion of the infant. A transfusion through the umbilical cord can be given up to eight or ten hours after birth. Unless definite symptoms of erythroblastosis are present no benefit is to be derived from the administration of blood. It is not a prophylactic measure. If symptoms of erythroblastosis are present and transfusion is given the blood should be Rh negative and of the same blood group as the infant.

PROCAINE ADMINISTERED INTRAVENOUSLY

To the Editor:—Has procaine hydrochloride in 1 per cent solution been used intravenously to check attacks of paroxysmal tachycardia?

Harry H. Brauer, M.D., Sisseton, S. D.

ANSWER.—Procaine hydrochloride in 1 per cent solution has been used dramatically in restoring normal rhythm in a boy aged 7 years with circulatory arrest due to proved ventricular fibrillation of twenty-seven minutes' duration. Cardiac massage was employed and procaine hydrochloride administered intravenously in two doses, the first one consisting of 3 cc. of 1 per cent solution given fifteen minutes after the cessation of the heart beat and 2 cc. given intravenously eleven and one-half minutes later with restoration of normal rhythm thirty seconds after the second injection. Ventricular fibrillation was proved by electrocardiogram. This case was reported in the August 28 issue of THE JOURNAL, page 1575, by Lampson, Schaeffer and Lincoln.

Intravenous administration of procaine has also been used prophylactically and effectively for the prevention and correction of cardiac arrhythmias associated with cyclopropane anesthesia as reported by Kraft in the *Canadian Medical Association Journal* (**57**:350, 1947). For this a 0.1 per cent solution was advised with or without thiopental sodium.

Procaine has also been used intravenously to relieve postoperative pain in the dilute solution of 0.10 per cent. With a stronger solution, toxic effects may result.

For the routine treatment of paroxysmal tachycardia, such therapy seems unnecessary, but in serious cases procaine may prove worth while, although it is not in routine use as yet.

SULFONAMIDE MIXTURES

To the Editor:—I am considering use of a mixture of sulfadiazine two parts with sulfamerazine one part. What is the consensus among authorities regarding use of sulfadiazine alone or in combination with other sulfonamide compounds in the treatment of infants and children?

F. A. Stewart, M.D., Newport, R.I.

ANSWER.—The purpose of mixtures of sulfonamide compounds is to lessen the toxicity to the kidney from the formation of crystals of the insoluble acetyl derivatives. The observation of Lehr (*Proc. Soc. Exper. Biol. & Med.* **58**:11-14, 1945) that the solubility of a sulfonamide compound in a mixture of sulfonamide compounds is independent of the concentrations of the other sulfonamide compounds present, whereas the therapeutic efficacy is additive, suggests that the optimum mixture consists of equal parts of each sulfonamide drug. The principal advantage of the mixture mentioned in the inquiry is lost by the use of unequal proportions of the two compounds.

Whether or not the use of mixtures of sulfonamide compounds is of any real advantage is controversial. Whereas Lehr maintains there is a decided advantage (*J. Pediat.* **29**:275, 1946; J. A. M. A. **137**:1150, 1948), Zeller and others (J. A. M. A. **136**:8, 1948) and Garb and Janoff (J. A. M. A. **138**:381, 1948) maintain that the advantages are not significant from the clinical standpoint. The papers by Lehr and by Zeller furnish information on dosage, absorption, excretion and toxic reactions.

There is therefore a theoretic advantage to the use of sulfonamide mixtures in children and infants, but whether this advantage is as great as that obtained by the use of sulfadiazine or sulfamerazine alone with the concurrent administration of sufficient alkali to maintain the urine at a p_H of 7.5 or higher remains to be determined.

SUBSTITUTE FOR TABLE SALT

To the Editor:—I have the problem of a practically salt-free diet for both myself and wife. I wonder whether you have a formula for making the substitute salt, which contains other chlorides of potassium, ammonium, etc. I have made up a fair substitute, potassium and ammonium chlorides equal parts with four parts of starch, which answers fairly, but have no doubt that you have a much better formula, and if it is available would much appreciate your advice in this matter.

George A. Skinner, M.D., Berkeley, Calif.

ANSWER.—The substitute about which you inquired is no doubt a preparation called "neo-curtasal," manufactured by Winthrop-Stearns, Inc. This material seems to be a fairly satisfactory substitute for ordinary table salt, and as you will see from its formula, contains no sodium.

DIABETES HEREDITY

To the Editor:—What is the incidence of diabetes mellitus in children with one diabetic parent?

M.D., Illinois.

ANSWER.—Since the tendency to become diabetic is probably transmitted through recessive genes, the incidence of diabetes in offspring with one diabetic parent depends on the carrier tendency in the marital partner. In a large series of diabetic persons one parent was found to have the disease in 9 per cent of the cases and neither parent in 91 per cent.

VENOMOUS BITES AND STINGS

To the Editor:—Strong exception must be taken to the advice (The Journal, October 30, page 720) to apply heat for relieving the pain of lizard or spider bites or scorpion stings. The accelerated absorption of poison with hyperemia must increase systemic dangers. As against the total absence of scientific evidence favoring heat, the use of cold is supported by: (1) the known analgesia of refrigeration; (2) the marked delay of absorption, shown by (*a*) retarded absorption of penicillin (Trumper, M., and Hutter, A. M.: *Science*, 100:432, 1944), (*b*) protection of rabbits against fatal quantities of mustard gas (Yudin, S. S.: *Am. Rev. Soviet Med.* 2:4, 1944) and (*c*) radical arrest of intoxication from infected gangrene and burns; (3) the anesthesia which facilitates incisions; (4) the known promotion of drainage by cold, presumably because coagulation of exudate is inhibited, and (5) a single newspaper report of a school teacher who applied ice to a scorpion sting, with complete suppression of all local and general symptoms.

Snake bite presents a more formidable problem, including local tissue necrosis produced by a powerful enzyme in the venom, particularly of the rattlesnake. This enzymic action can be arrested by refrigeration, but too prolonged contact with tissues may result in even greater destruction after the temperature is raised. This is not a hazard with lizards, scorpions, spiders, bees, etc., and with a sufficiently dangerous snake bite the local may be preferable to the systemic risk.

This brings up the old tradition of the tourniquet. My own experiments with snake venom (*South. M. J.*, 31:1248, 1938; *Am. J. Trop. Med.*, 19:393, 1939) were made unsuccessful by the use of an occlusive tourniquet, which is disastrous even at ice temperature and still more so at normal temperature. Poisons such as strychnine and procaine are destroyed rapidly enough so that if a fatal dose is injected in a limb, a tight tourniquet applied and released at suitable intervals can absolutely save life. The fallacy for venom is that its destruction requires more time than is feasible for tourniquet application. There is just one use for an occlusive tourniquet. Snakes kill over 30,000 persons in the world annually, and over 90 per cent of the bites are on the limbs. Antivenin is seldom available in time, and excision can seldom cope with the astonishingly rapid diffusion of the venom. The knowledge should be broadcast that a presumably fatal bite, even from a bushmaster or king cobra, can be countered by immediate application of a tight tourniquet a few inches above the wound. Amputation can then be performed when feasible, perhaps hours later when the limb is completely insensitive. Except in the rare instances of direct injection of venom into a vein, it is always possible thus to save life at the cost of a limb. But since most snake bites are not fatal, and drainage by incision and suction has been proved beneficial, a tourniquet if used should be limited to a light "venous" constriction for promoting this process.

The main conclusion is that refrigeration with ice or the coldest obtainable water should be included in the treatment of snake bite for reducing pain and retarding absorption; and for lesser bites and stings it not only will relieve symptoms but may be practically curative.

Frederick M. Allen, M.D., New York 28.